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ABSTRACT

This book describes and examines the crisis within higher education in Japan as it applies to what is taught as compared to the labor market needs of the country. The book is divided into three chapters. Chapter 1 describes the higher education system in Japan and its enrollment, the distribution of enrollment by field of study, and the flow of students into the labor market from microscopic and macroscopic aspects. The second chapter focuses on the supply of, and the demand for, graduates from higher education institutions; reviews trends in employment conditions in terms of employment rates and relative wage levels; analyzes the sources of demand for higher education graduates with respect to the shift in industrial structure; offers tentative analyses on the process of supply-demand interaction in the past; and speculates on the direction of future changes by analyzing corporate needs for the graduates. The final chapter examines graduates who are already working in various organizations and how they continue to acquire knowledge and skills. Prevalent practices of corporate training and education are described, as are factors forcing changes to conventional practices, and the government policies in response to the new environment. Appendices provide supportive statistical tables. Contains a 23-item bibliography. (GLR)

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HIGHER EDUCATION AND EMPLOYMENT IN JAPAN

Motohisa Kaneko

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Trends and Issues

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PREFACE

With the rapid structural changes in economy and society, the relation between higher education and employment has been shed fresh lights as a critical issue in Japan. It is ironical that the concern has not risen from depressed labor market. In fact, the prospect of employment for college graduates has been very bright in past few years. Nonetheless, it has been widely argued that what is taught in higher education appears to be losing its relevance to work. In that sense, higher education is in crisis.

Japan, however, does not seem to be alone in that aspect. In many countries over the world, the relation of higher education to the labor market has been attracting attention. From this perspective, the Education Committee of OECD launched in 1988 an international research activity entitled "Higher Education and Employment: The Changing Relationship." The study reported in this volume originated as Japanese contributions to this activity.

The author is grateful to Ms. Dorotea Furth, Ms. Danielle Colardyn, Mr. Eric Esnault and Mr. Keisuke Yoshio of the OECD secretariat for their initiative and support. Also, generous assistance and advices extended by the administrative officers at the Ministry of Education, Science and Culture, Japan, are gratefully acknowledged. The views expressed here, however, are strictly those of the author.

Last, but not least, special acknowledgement is due to Ms. Mariko Sakamoto who has been indispensable in preparing the early reports and the present volume.

March 1992

Motohisa Kaneko

TABLE OF CONTENTS

Preface i
Table of Contents iii
List of Figures iv
List of Tables v
List of Appendix Tables vi

Chapter 1. THE HIGHER EDUCATION SYSTEM AND ITS GRADUATES 1
1. The Higher Education System 2
2. Enrollment by Field of Study 6
3. The Entry to Employment 10

Chapter 2. SUPPLY AND DEMAND OF COLLEGE GRADUATES 19
1. Employment Condition for New Graduates 20
2. Sources of the Demand for Educated Labor 30
3. Supply-Demand Interaction 38
4. Changing Corporate Needs 42

Chapter 3. CONTINUING EDUCATION OF THE GRADUATES 51
1. Conceptual Issues 52
2. Present Forms of Continuing Education 57
3. Challenges to the Corporate Mode 67
4. Response of Higher Education 76

CONCLUSIONS 85

SELECTED BIBLIOGRAPHY 91
STATISTICAL APPENDIX 93

LIST OF FIGURES

1. Flow of Students in the School System - % of Age Cohort, 1987 4
2. Changes in Enrollment Rates 5
3. Enrollment of University by Field of Study, 1990 7
4. Number of Graduates by Type of Institution, 1960-1990 21
5. Direct Advancement/Employment Rate, 1960-1990 23
6. Changes in Relative Wage Index by Education
   - High School Graduates = 100 24
7. Direct Advancement/Employment Rate by Field of Study
   - University, Males 27
8. Direct Advancement/Employment Rate by Field of Study
   - University, Females 28
9. Direct Advancement/Employment Rate by Field of Study
   - Junior College, Both Sexes 29
10. Employed Graduates by Industrial Sector
    - University, Males, All Fields of Study 31
11. Employed Graduates by Industrial Sector
    - University, Females, All Fields of Study 32
12. Employed Graduates by Industrial Sector
    - Junior College, Both Sexes, All Fields of Study 33
13. Changes in the Size of H.E. Graduates in Labor Force
    by Industrial Sector 34
14. Contribution of Industrial Sectors to the Increase
    in H.E. Graduates in the Labor Force 35
15. Contributing Factors to the Increase in the Employment
    of H.E. Graduates in 1977-1987 Period 37
16. Occupational Distribution of H.E. Graduates - 1968-1982 52
17. Predicted Needs for and Actual Role of Off-JT in Future 73
18. Planned Cooperation with Higher Education Institutions
    - Sample Survey of 421 Large Scale Corporations 76

LIST OF TABLES

1. Number of Institutions and Enrollment, May 1991 2
2. Employment Status of Graduates by Type of Institution, 1990 13
3. Employment Status of Graduates from University by Field of Study, 1989 15
4. Employed New Higher Education Graduates by Industrial Sector, 1990 16
5. Association between the Field of Study and the Sector of Employment - University, 1990 18
6. New Graduates Who Went into Employment by Education Level, May 1990 20
7. Perceived Employees Shortage/Surplus by Type of Work - Large Scale Firms, 1989 43
8. Number of Responses Predicting Shortage of Graduates by Field of Study 44
9. Evaluation about Recent Graduates by Academic/Personality Traits, 1990 46
10. Level of Schooling among Fresh Recruits to Software Industry - Sample Survey, 1984 and 1986 47
11. Corporate vs. Individual Model of Education/Training 56
12. Existence of Training Programs - 407 Large Scale Corporations 58
13. Example of Induction Training - Case of A Large Electronics Manufacturer 59
14. Corporate Policies Regarding Job Rotation 62
15. Existing Methods for Off-JT 63
16. Number of Extension Courses Provided by STS 66
17. Extension Courses of STS - Number of Students by Employment/Schooling Status 66
18. Perceived Gap Between What was Learned and What is Needed 70
19. Desirable Qualities to be Obtained through Worker Education - Sample Survey of 421 Large Scale Corporations - 71
20. Limiting Factors of Off-JT 74
21. Desirable Means for Promoting Off-JT - Sample Survey of 421 Large Scale Corporations - 75
22. Graduates Departments Receiving Continuing Education Students - May 1989 81

TABLE OF APPENDIX TABLES

A-1. Higher Education Institutions and Their Enrollment, May 1991
- By Type and by Control of Institution 94

A-2. Enrollment by Broad Category of Departments and by Type of
Establishments - 4-Year Institutions, 1989..... 95

A-3. Enrollment by Broad Category of Departments
- 4-Year Institutions, 1989..... 96

A-4. Enrollment by Broad Category of Departments
- 2-Year Institutions, 1989..... 97

A-5. Enrollment by Field of Study - Special Training Schools, 1989..... 98

A-6. Changes in Enrollment in 4-Year Institutions by Departments..... 99

A-7. Changes in Enrollment in 2-Year Institutions by Departments..... 100

A-8. Changes in Female Share(%) by Field of Study
- 4-Year Institutions..... 101

B-1. Employment Status of Graduates by Field of Study
- Male, 4-Year Institutions, 1989..... 102

B-2. Employment Status of Graduates by Field of Study
- Female, 4-Year Institutions, 1989..... 103

B-3. Employment Status of Graduates by Field of Study
- 2-Year Institutions, 1989..... 104

B-4. Employment Status of STS Graduates..... 105

B-5. Direct Advancement/Employment Rate by Field of Study
- 4-Year Institutions, Male 106

B-6. Direct Advancement/Employment Rate by Field of Study
- 4-Year Institutions, Female 107

B-7. Direct Advancement/Employment Rate by Field of Study
- 2-Year Institutions, Female 108

C-1. Employed Graduates by Industry
- 4-Year Institutions, Both Sexes, All Departments..... 109

C-2. Employed Graduates by Industry
- 4-Year Institutions, Male, All Departments..... 110

C-3. Employed Graduates by Industry
- 4-Year Institutions, Female, All Departments..... 111

C-4. Employed Graduates by Industry
- 2-Year Institutions, Both Sexes, All Departments..... 112

C-5. Employed Graduates by Industry
- 4-Year Institutions, Both Sexes, Humanities....113
C-6. Employed Graduates by Industry
- 4-Year Institutions, Both Sexes, Social Sciences....114
C-7. Employed Graduates by Industry
- 4-Year Institutions, Both Sexes, Natural Sciences....115
C-8. Employed Graduates by Industry
- 4-Year Institutions, Both Sexes, Engineering....116
C-9. Employed Graduates by Industry
- 4-Year Institutions, Both Sexes, Health-Related....117
C-10. Employed Graduates by Industry
- 4-Year Institutions, Both Sexes, Education....118
C-11. Changes in Industrial Distribution of Employed
New Graduates from 4-Year Institutions, Both Sexes....119
C-12. Factor Decomposition Analysis of the Increase in
Employed Higher Education Graduates, Male 1960-1988....120
C-13. Factor Decomposition Analysis of the Increase in
Employed Higher Education Graduates, Female 1960-1988....121

Chapter 1

THE HIGHER EDUCATION SYSTEM AND ITS GRADUATES

This Chapter describes the higher education system in Japan and its enrollment (Section 1), the distribution of enrollment by field of study (Section 2), and the flow of students into the labor market from microscopic and macroscopic aspects (Section 3).

1. THE HIGHER EDUCATION SYSTEM

The Higher Education System

The higher education system in Japan consists of the following four types of institutions:

a) University and College
b) Junior College
c) Technical College, and
d) Special Training School.

All of these institutions are legally mandated to be chartered by the Ministry of Education, Science and Culture (MESC hereafter). Twelve years of primary and secondary education is a prerequisite before admission, implying that entrants have to be 18 years of age or older. Not included here are Proprietary Schools (Kakushu Gakko) that do not qualify for Special Training School, and Occupational Training Centers under the Ministry of Labor or under local governments. Among the institutions above, those belonging to categories a) through c) constitute higher education in a strict sense, while d) forms a segment comparable to what is called post-secondary education in some other countries. The number of higher education institutions and their enrollment are summarized in TABLE 1.

TABLE 1
Number of Institutions and Enrollment, May 1991

	N. of Institutions	Enrollment (thds.)	
University & College	514	2,206	
Graduates		99	
Under-Graduates		2,107	
Junior College	592	504	
Technical College	63	20	a)
Special Training School	2,785	658	b)

Source: Appendix Table A-1.
Notes: a) 4th and 5th graders only.
b) Post-Secondary courses only.

Four-year *universities and colleges* (both called "Daigaku") constitute the core of higher education in Japan. In the discussion which follows, the use of the word "University" will imply any type of four-year institutions of higher education. As of May 1991, there were 514 (97 national, 39 local public and 378 private) institutions enrolling some 2.1 million students. Of these institutions about two-thirds offered graduate courses where 99 thousand students were studying for a Master's or a Doctor's degree. Graduation from under-graduate courses normally requires four-years of course study, except in the cases of Departments of Medicine and Dentistry which require six years.

Two-year *Junior Colleges* (Tanki-Daigaku), which tended to be small in size, numbered 592 and enrolled half a million students. With student bodies predominantly female (90 percent), most of these institutions offer terminal education in non-technical subjects such as Literature or Home Economics. Unlike the case of the Community College in the United States, transfer from a two-year to a four-year institution is exceptional.

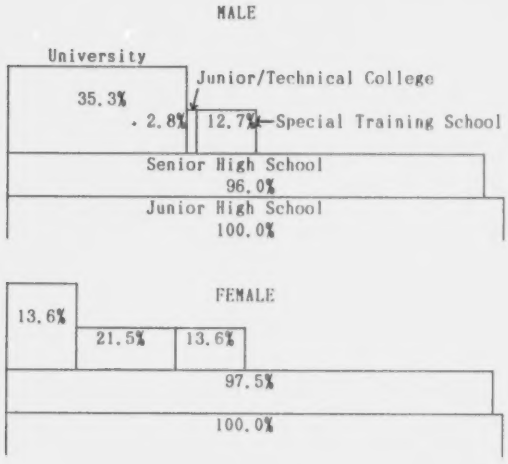
Technical Colleges (Koto Senmon Gakko) admit graduates from junior high schools. They require five years for completion, the first three years corresponding to upper secondary education and the final two years to higher education. In 1991 there were 63 such institutions and they were concentrated in technical and engineering fields. Total enrollment was minor (less than 1 percent) compared to the enrollment of higher education enrollment in total.

Special Training Schools (Senshu Gakko), on the other hand, constitute a rapidly growing segment in Japan's higher education. In most cases these institutions had originally been proprietary schools offering various types of occupational training before they received, at amendment of School Education Law, a charter from the Ministry of Education, Science and Culture. Their post-secondary courses require a high school diploma for admission. Most of these institutions provide occupational or technical training including computer programming and foreign languages. Reflecting the diversity of offered training, the curriculum and the years required for completion vary greatly. Over the last decade, Special Training Schools showed a remarkable expansion. Today, with the enrollment in their post-secondary courses totalling 658 thousand, they constitute the second largest segment of the higher education system.

One of the major characteristics of the higher education system in Japan is the significance of private institutions. About three-quarters (74.9 percent) of under-graduate enrollment in universities and colleges are enrolled in private institutions. Private institutions' shares in enrollment are even greater at junior colleges (91.9

FIGURE 1

Flow of Students in the School System - % of Age Cohort, 1987



Source: Estimated from School Fundamental Survey, 1987.

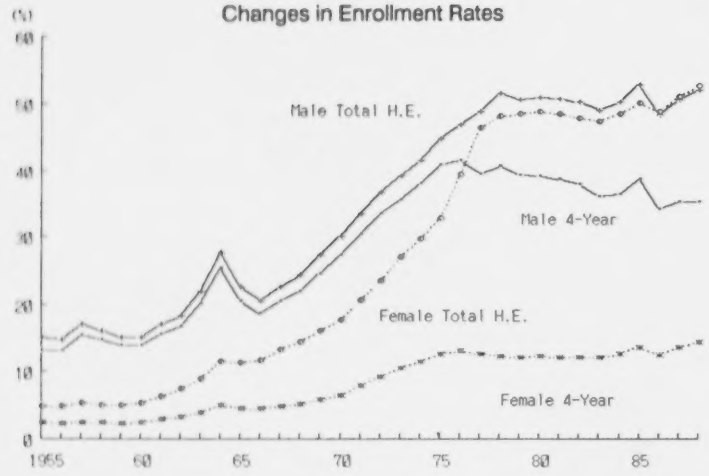
percent) and at Special Training Schools (93.5 percent). For a more detailed description of the public and private sectors of higher education in Japan, readers are referred to Kaneko [1989].

Level of Enrollment

The recent flow of students through the education system was estimated based on the example of the age cohort that entered higher education institutions in 1987 (FIGURE 1). After completing junior high school at age 15, about 97 percent of that age cohort advance to upper secondary education provided at senior high schools. A small number of the students enter occupational training centers, secondary-level courses of Special Training Schools, or Miscellaneous Schools. The advancement rate of an age cohort to post-secondary education is 51 percent for males and 49 percent for females, implying that about a half of youths, either boy or girl, would receive some form of post-secondary education. The distribution across different types of post-secondary education, however, differs considerably by gender. While 35 percent

FIGURE 2

Changes in Enrollment Rates



Source: School Fundamental Survey

of male cohorts go to four-year universities and colleges, only 14 percent of female cohorts would do so. Instead, as much as 22 percent of female cohort would enter two-year junior colleges compared to 3 percent (including Technical Colleges) for males. The share of those entering the post-secondary courses at Special Training Schools are similar between males and females, at around 14 percent of the age cohort.

The postwar trend of higher education enrollment in Japan can be divided into three phases as indicated in FIGURE 2. The first phase is the relative stability of the 1950s, when gross enrollment ratio (defined as the ratio of entrants to higher education institutions relative to the population reaching age 18 at a given year) stayed around the 15 percent-level for males and around 5 percent for females. A rapid expansion of enrollment took place in the 1960s and in the first half of the 1970s, which resulted, despite the growth of eligible population with the advancement of the baby-boom generation to college-going age, in a sharp rise in enrollment rates [Kaneko 1987]. By 1975, enrollment rates reached the 45 percent-level for males and 33 percent-level for females. In the third phase, which started in the mid-1970s and lasted to the present, the enrollment rate at four-year universities showed a slight decline for males and stagnation for females. This is partly due to the shift in the demands for higher education, and partly due to the governmental policy of limiting

the supply of places in universities. However, during the same period, Special Training Schools, given a legitimate status in the educational system by a revision to the School Education Law in 1976, grew at impressive rates. As a result, the enrollment rate in the whole higher education system for males showed a slight increase to around the 50 percent level. That for females showed a marked increase, from 33 percent in 1975 to 53 percent in 1988.[1]

2. ENROLLMENT BY FIELD OF STUDY

Classification of Fields

In this study, the fields of study in higher education institutions are classified into three categories:

a) Humanities and Social Sciences (HSS)

b) Natural Sciences and Engineering (NSE):

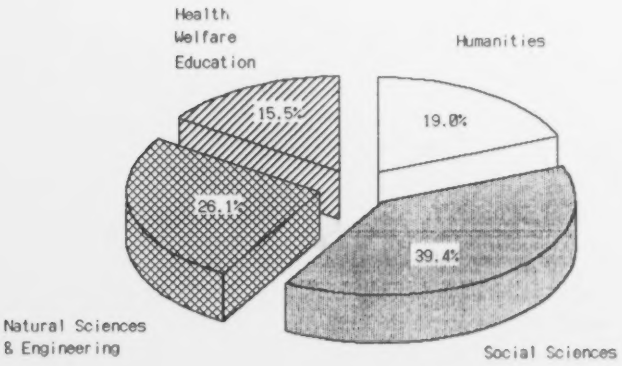
c) Health-Welfare-Education (HWE):

The first category, HSS, comprises the humanities, foreign languages, social sciences including law and liberal arts courses. The second category, NSE, includes natural sciences including mathematics, engineering and technology, agriculture, and information sciences. The last, HWE, comprises health-related subjects including medicine and pharmacology, as well as social-services and education. Education was not classified as a subfield of humanities, because a large proportion of teacher-training departments in Japan have curricula encompassing natural sciences as a subject of teaching.

A problem that deserves attention when international comparison is made is the internal organization of the fields of speciality within higher education institutions. Typically in Japan, a higher education institution is divided into several Faculties (Gakubu), which in turn is sub-divided into Departments (Gakka). The Faculty can be various combination of fields of study. For example, the Faculty of Letters at leading universities often comprises sociology and/or psychology as well as various fields of humanities. Similarly, the Faculty of Arts and Sciences encompass both the natural sciences and the HSS. One analytical problem arising from such construction of the Faculty is that statistics taken at the Faculty level do not always correspond to the HSS/NSE/HWE breakdown. Fortunately, the enrollment statistics taken by the

1 For a more systematic analysis about the changes in enrollment rates, readers are referred to Kaneko [1987].

FIGURE 3
Enrollment of University by Field of Study, 1990



Source: 1990 School Fundamental Survey

Ministry of Education, Science and Culture are regrouped to the Department level, which correspond to the HSS/NSE/HWE division more closely. The discussion below are be mainly based upon those statistics.

Enrollment by Field of Study

The distribution of enrollment over fields of study is presented in FIGURE 3. Of the students in four-year universities and colleges, more than half (59 percent) were enrolled in the Humanities, Social Sciences and related (HSS) fields, while about one-quarter (26 percent) were in the Natural Sciences, Engineering and related (NSE) fields, and the remaining 16 percent in the Health, Welfare, Education and related (HWE) fields. Among the sub-fields of the HSS, Economics/Commerce enrolled the largest number of students, accounting for 26 percent of total enrollment in four-year institutions. In fact, this was the largest share among all fields of study. The next largest were Literature and Law, each accounting for about ten percent of total enrollment.

The distribution across field of study varied substantially by type of establishment. In national universities, only 27 percent were enrolled in the HSS fields, compared to 67 percent in private institutions (Appendix Table A-2). In private institutions, particularly pronounced is the large share (30 percent) of Economics-Commerce (30 percent), Law (11 percent) and Literature (11 percent). Meanwhile, enrollment in national institutions were concentrated on the NSE fields (43 percent) and on the HWE fields (30 percent) than that in private institutions (22 percent and 11 percent). In consequence, of the 1.079 million students enrolled in the HSS courses of four-year universities and colleges, as much as 87 percent were in private institutions.

The pattern of distribution also varied substantially by gender (Appendix Table A-3). The difference by gender with respect to the share of the HSS fields as a whole was minimal, both male and female students accounting for 56-57 percent of the total. But the patterns of distribution within the HSS category differed considerably. Male students concentrated more heavily on the Social Sciences (47 percent of the total enrollment) than on the Humanities (7 percent). In contrast, female students tended to enroll less in the Social Sciences (19 percent), and more in the Humanities (36 percent). Among the sub-fields, male students concentrated particularly on Economics/Commerce (32 percent) while 26 percent of female students enrolled in Literature. Looking the distribution from another side, the share of female students in total enrollment was as low as 9 percent in Economics/Commerce, but as high as 72 percent in Literature. Outside the HSS fields, male students enrolled more in the NSE fields than female students (34 percent vs. 7 percent), but less in the HWE fields (10 vs. 30 percent).

Enrollment in the Non-University Sector

The pattern of enrollment in two-year junior colleges (Appendix Table A-4) was characterized by heavy concentration on the HWE fields, especially on Home Sciences (25 percent of total enrollment) and on Education (17 percent). Even though the Humanities departments enrolled almost the same number of students as the Home Sciences departments, the HSS fields as a whole accounted for a lower proportion than those in universities. This is primarily due to lower enrollment in the Social Sciences departments in junior colleges. Meanwhile, the NSE fields comprised a negligible 6 percent of junior college students. It should be noted that most of the male students in junior colleges were enrolled in those departments. Male students, however, constituted less than 10 percent of the total enrollment in junior colleges.

The enrollment in Special Training Schools concentrated on the fields for practical training (Appendix Table A-5). But within the technical fields, the distribution varied between the male and female students. More than a half of the male students were studying in industry-related subjects, such as Electronics and Information Processing. In contrast, the most popular fields among female students were Health-Related (32 percent). Nonetheless, the second most popular field was the same for male and female students: about 17 percent of the male, and 19 percent of the female students were in the Business-Related courses.

The graduates from junior colleges followed a similar pattern of change to that of universities (Appendix Table A-7). Special Training Schools, on the other hand, did not start having graduates until the late 1970s, but in the 1980s the number of their graduates kept increasing. Recently, the "second baby boom generation" have started to reach the eligible age for higher education, and the number of graduates from both junior colleges and Special Training Schools have risen rapidly.

A significant change observed in the recent years is the increase in female enrollment rate in four-year institutions of higher education. Also, the shares of female students have been increasing in Social Sciences and the NSE fields, where they had been particularly under-represented (Appendix Table A-8). Obviously, it reflects the improvement in employment prospects the female students in these fields. This topic will be discussed in Chapter 2.

Differences in Unit Cost by Field of Study

There is substantial variation among the fields of study with respect to student/teacher ratio, especially among private institutions. In 1987, the number of students per one full-time faculty member was 69 for Law, 67 for Economics and 66 for Commerce in private institutions. In the Humanities courses the ratios appeared lower, but still in the range between thirty and forty. In contrast, the ratios were lower in Natural Sciences (25), Engineering (30) or Pharmacy (15). National institutions in general enroll much fewer students per faculty member.

Partly due to the large number of students per faculty member, the HSS departments in private institutions were characterized by low unit costs.[2] Estimated cost per student for private institutions in 1987 was around 0.9 million Yen for Law or

2 It should be noted that estimation of average cost per student involves various technical problems and are subject to considerable variation depending on employed assumptions. Nonetheless, the estimated differences are large enough to indicate that there were in fact substantial differences.

Economics departments, as compared to 1.4 million for Engineering departments and 1.2 million in Natural Sciences departments. For the health-related courses the costs were considerably higher.

These observations indicate that the HSS departments, particularly Social Sciences departments, helped the financial status of private institutions considerably. In fact, it is said that in many private institutions Social Sciences departments produce financial surplus, which subsidize to such high cost departments as Natural Sciences or Engineering. Also, enrollment capacity in the HSS fields was most elastic to changes in demand for the opportunities of higher education, presumably reflecting relatively smaller marginal cost for enrollment expansion. In the late 1980s, the government policy was made to allow and encourage temporary enrollment expansion in order to accommodate the unusually large age-cohort of "second baby-boomers." Subsequently, enrollment in the HSS fields has increased more than the other fields.

3. THE ENTRY TO EMPLOYMENT

This section describes the process of transition from higher education institutions to employment, first from microscopic aspects, and then from macroscopic aspects.

Microscopic Aspects - Job-Search and Recruitment

A typical university student in Japan would start active job-search activities at the beginning (April) of the fourth academic year. In the summer, the employers would start accepting application and then invite selected students for interviews and a written examination. This process continues theoretically until all prospective employees are matched with employers or until the end of the academic year, which is March. In practice, a majority of the students will be set by January. Most of the students hired for a permanent job start working on April 1.

It is important to note that the process of matching is a process of competition among the graduating students over better job opportunities, which tend to be those at better-paying and large scale corporations. It is also a process of competition among the prospective employers over the most desirable students, typically the ones from more selective institutions. To various degrees similar mechanism should be found in any society with a free economy and free labor market. But, the competition may be

particularly intense in Japan, because white-collar workers tend to stay in a single firm for their whole working life. For both the employees and the employers, the choice at the point of graduation from higher education institutions determines the rest of the employees working life.

Because of the recent excess demand for higher education graduates, the competition has become even more fierce. As a result, business firms are starting the process of interviews and examinations earlier every year, intending to secure the better students before other firms can contact the students. There has been serious concern that this should undermine education in the last academic year of higher education. Various associations of business leaders and the government thus have established a guideline stipulating a specific date after which employers can start the process of recruiting. It is said, however, that this guideline has not been fully observed.

The process of job-search involves various agents. The formal source of information for the students is the placement office, which are normally attached to the institution or, in the case of large scale institutions, to each Faculty. More informal sources of information are professors and past graduates. The information that these sources provide tends to be about the employers that have had relatively strong association with the institution. In recent years, another source of information has gained importance. That is the commercial job-information enterprises, that publish a collection of information about employers. Normally, these firms collect fees from employers and distribute free copies to the students. Also a few firms publish monthly or weekly newsletters listing various job opportunities. These information sources tend to provide students with information about employment opportunities that are not conveyed through more formal channels. The emergence of the commercial services has presumably helped the students to widen their scope of job search.

The pattern of job-search varies substantially by field of study. Typically, graduates of engineering departments will consult with their professors about their employment. The professors, on the other hand, are contacted by various companies in the manufacturing industry with which they have a close association. The close informal link between individual faculty member and corporate engineers is thus reinforced by the flow of graduates. In contrast, the students in the HSS fields are in principle left free and expected to look for job opportunity by themselves. Particularly those in the national institutions tend to seek various means to get information and

contact. An increasing number of private institutions, on the other hand, lay emphasis on placement function as a means of raising attractiveness to future students.

Employment Rate of the Graduates

In April 1990, about 800 thousand students graduated from various institutions of higher education (TABLE 2). Of these students, one half, or 400 thousand (290 thousand male and 110 thousand female), were graduates from universities. Of the remaining 400 thousand, a half (208 thousand) graduated from junior colleges, and the other half (205 thousand) graduated from the Special Training Schools.

According to a set of statistics compiled by the MESC, of the males graduated from universities in 1990, 83 percent were employed in a permanent job directly after graduation, 8 percent went on to graduate studies, with the remaining 9 percent either temporary employed, unemployed or destination unknown. The employment status of the female graduates was almost similar, with the corresponding proportions at 82 percent, 4 percent, and 14 percent respectively. As for the junior college graduates, 87 percent were employed in permanent work, 3 percent transferred to four-year institutions, and the remaining 10 percent either in a temporary job, unemployed or unknown.

The data described above were derived from a Ministry of Education survey on the status of graduates. The survey is based on the reports provided by individual higher education institutions. It categorizes the status of graduates into four classes, i.e. "further education," "employed," "temporary work," and "unknown." Those classified as temporary work or unknown include those who are actually employed but did not report it to the institution. Especially those students who found job without the assistance of the placement office are likely to fall in this category. There is enough evidence to suggest that at least in recent years the actual proportion of students who had been actively seeking a job, and failed to find one is minimal, especially among the males. It can be conjectured, however, that most of those classified as "temporary work or unknown" in this survey are those who had a job of more temporary nature or through a less regular recruitment route than those classified as "employed." On the other hand, those classified as "employed" are likely to have the more desirable job opportunities.

TABLE 2

Employment Status of Graduates by Type of Institution, 1990

	Total Graduates	Employment Status				
		Further Education	Employed	Temporary Work	Not-Employed	Others
N. of Graduates						
University						
Male	290,353	23,222	241,201	1,631	12,531	11,768
Female	109,750	3,879	90,270	2,014	9,817	3,770
Both Sexes	400,103	27,101	331,471	3,645	22,348	15,538
Junior College						
Male	14,976	1,912	10,865	202	1,220	777
Female	193,382	5,086	170,266	1,965	13,323	2,742
Both Sexes	208,358	6,998	181,131	2,167	14,543	3,519
Special Training School a)	205,107	9,776	184,082	-	-	12,324
% Distribution						
University						
Male	100.0	8.0	83.1	0.6	4.3	4.1
Female	100.0	3.5	82.3	1.8	8.9	3.4
Both Sexes	100.0	6.8	82.8	0.9	5.6	3.9
Junior College						
Male	100.0	12.8	72.5	1.3	8.1	5.2
Female	100.0	2.6	88.0	1.0	6.9	1.4
Both Sexes	100.0	3.4	86.9	1.0	7.0	1.7
Special Training School	100.0	4.8	89.7	-	-	6.0

Source: 1990 School Fundamental Survey.

Note: a) Figures for 1987 Graduates. Numbers for individual categories of Status do not add up to the indicated total due to double entry to 'Further Education' and 'Employed.'

For the graduates of the Special Training Schools, comparable data are not collected annually. However, in 1989 the MESC conducted an ad hoc survey on Special Training Schools including in its scope the employment status of the graduates. According to the survey results, also presented in TABLE 2, as much as 90 percent of the graduates found permanent employment at the time of graduation, and 5 percent went either to universities or other institutions of higher education. The proportion of unemployed fresh graduates, defined as those looked for a work but failed to find one, is considered to be minimal.

The Field of Study and Employment Status

Employment condition varies substantially by the field of study. The distribution of university graduates over various employment status are presented by field of study in Appendix Tables B-1 and B-2. Basic statistics are summarized in TABLE 3. The table demonstrates in the first place that the proportion of the students entering graduate courses varies enormously. In the case of male graduates, as much as 26 percent of the Natural Sciences graduates and 17 percent of the Engineering graduates did so, while the proportion was only less than 1 percent among the Social Sciences graduates.[3] The low share of "employed" at 80 percent does not therefore imply a poor employment prospect. From this aspect, it will be useful to define a rate expressing the proportion of graduates who, directly after graduation, either advanced to further education or went into permanent employment. We call this index a "direct advancement/employment rate" (d.a.e. rate). It would generally reflect the favorableness of employment condition for college graduates.

Looking at TABLE 3 again, it is evident that the prospect of employment was more favorable for Engineering graduates. Among male university graduates the direct advancement/employment rate reached levels as high as 97 percent. The comparable rate is estimated at 93 percent for departments of Natural Sciences and also 93 percent for Agriculture. In contrast, graduates from the departments of Arts, Humanities and Education faced unfavorable employment prospects as indicated by the relatively low direct advancement/employment rates of 73 percent, 77 percent, and 79 percent.

TABLE 3 also demonstrates that a similar pattern of differences by subject fields can be observed with female university graduates. Female graduates from the NSE fields, though small in number, faced favorable employment prospects with the d.a.e. rates at well over the 90-percent level. Meanwhile, less than 80 percent of the graduates from departments of Arts or Education were reported as having a permanent job or going on to graduate courses. The lower direct advancement/enrollment rates for females as a whole is therefore attributable to their concentration on subject fields characterized with less favorable employment prospects.

As for the graduates from 2-year institutions, the d.a.e. rate reached almost the 90-percent level (Appendix Table B-3). Considering that the graduates are predominantly female, the employment prospects were even better for graduates from 2-year

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3 The relatively high proportion of "Further Education" for Health-Related graduates in the Table reflects two factors. For one, the graduates from Pharmacology actually record high percentages of entering graduate courses. For another, graduates from Medicine or Dentistry are required to go through two years of internship after graduation, which is categorized as a form of further education.

TABLE 3

Employment Status of Graduates from University by Field of Study, 1989

	Distribution over Employment Status (%)							
	Male				Female			
	Total	Further Education	Employed	Temporary Work/ Not Employed/ Unknown	Total	Further Education	Employed	Temporary Work/ Not Employed/ Unknown
All Fields	100.0	10.0	80.1	9.9	100.0	4.8	78.4	16.8
Humanities	100.0	5.4	71.9	22.7	100.0	2.3	81.0	16.7
Social Sciences	100.0	0.8	88.4	10.8	100.0	1.8	82.3	15.9
Fine Arts/ Performing Arts	100.0	8.9	64.0	27.1	100.0	5.7	68.8	25.5
Natural Sciences	100.0	25.6	67.4	7.0	100.0	14.7	78.9	6.4
Engineering	100.0	16.7	80.7	2.6	100.0	11.4	85.4	3.2
Agriculture	100.0	15.3	77.8	6.9	100.0	8.7	83.0	8.3
Merchandise-Marine	100.0	36.6	62.1	1.3	100.0	87.5	12.5	0.0
Health-Related	100.0	59.4	27.2	13.4	100.0	20.1	65.2	14.7
Home Science	100.0	1.9	88.5	9.6	100.0	2.0	85.9	12.1
Education	100.0	4.9	73.7	21.4	100.0	3.1	75.1	21.8
Others	100.0	6.9	85.0	8.1	100.0	3.1	76.6	20.3

Source: Appendix Tables B-1 and B-2.

institutions than those from universities. Moreover, the distribution of employment status did not vary much by subject fields. Even among Humanities graduates, 90 percent obtained some form of stable employment or educational status.

The prospect of employment was even brighter for the Special Training Schools graduates. According to the survey on Special Training Schools, the proportions of the graduates who are not employed in a permanent job or continuing study in other types of schools were negligible. The proportion was particularly small for the Engineering and Business fields, but, even for graduates from such fields as Culture or Home Science, the corresponding figure was less than 10 percent. It should be noted that these figures are based on the reports from individual Special Training Schools. Since these institutions are mostly private with explicit goals of providing students with good employment opportunities, it is conceivable that their reports were somewhat biased upward. Nonetheless, other evidences indicate that the bias would not be exceedingly large.

Destination of the Graduates

The employed graduates from universities or junior colleges numbered about half a million, and their distribution over industrial sectors is presented in TABLE 4. Slightly more than one-third of the graduates found employment in the Services Sector and the Government, one-third in the other industries of the tertiary sector such as the Trade or Bank/Insurance, and the remaining one-third in the Primary and Secondary Sector. The distribution, however, varied significantly by type of institution and also by gender. Male graduates from four-year institutions tended to concentrate on the Primary and Secondary Sector (39 percent) and, within the tertiary sector, on Trade and Bank/Insurance (27 percent). In contrast, female university graduates tended to concentrate less on these sectors (22 percent and 24 percent respectively), but more on the Services industry. Indeed, more than one-half of them were employed in Services or in the Government.

TABLE 4

Employed New Higher Education Graduates by Industrial Sector, 1990

	Total	University			Junior College		
		Total	Male	Female	Total	Male	Female
Total N. of Employed Graduates	505,450	324,220	235,328	88,892	181,230	10,923	170,307
Percent Distribution (%)							
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Primary & Secondary Sector							
Total	30.4	34.3	39.0	21.9	23.3	31.6	22.8
Manufacturing	24.8	27.9	31.2	19.1	19.3	23.5	19.0
Others	5.6	6.4	7.8	2.9	4.0	8.2	3.8
Tertiary Sector							
Total	69.6	65.7	61.0	78.1	76.7	68.4	77.2
Trade	15.5	14.4	15.0	12.6	17.4	29.9	16.6
Bank/Insurance	15.0	12.7	13.4	10.9	19.1	2.6	20.2
Services/Transport	31.9	29.5	22.9	47.0	36.1	27.5	36.7
Government	6.6	8.4	9.0	7.0	3.3	6.5	3.1
Others	0.7	0.7	0.7	0.5	0.7	1.9	0.6

Source: Quick Report of School Basic Survey, 1990, Tables 5 and 13.

Junior college graduates as a whole appeared to be less likely to find employment in the Primary and Secondary Sector. The proportion of graduates in that sector was only 23 percent as compared to 34 percent in the case of university graduates. The proportion, however, was not different from the case of female university graduates. Female junior college graduates were more concentrated on Trade and Bank/Insurance than the female university graduates (37 percent vs. 24 percent), but less on Services and the Government (40 percent vs. 54 percent). According to data showing occupational distribution of junior college graduates, about half of the graduates from Education and Health-Related departments found jobs as a teacher at primary and pre-school level. Most of the rest were hired for clerical works.

There were some degrees of association between the field of study and the destination of the student in terms of industrial sector. TABLE 5 presents the flow of students from different fields of study to industries. It is evident that two fields of study stand out by its heavy concentration on particular industries. 73 percent of the Engineering graduates found employment in the Primary and Secondary Sector which include the manufacturing sector; and 75 percent of the Education graduates entered the Services/Transport industries, which include educational institutions. It is also noteworthy that almost half of Natural Sciences graduates went to the Primary and Secondary Sector, while more than half of Health-Related graduates found jobs in the Services/Transport industries. In contrast, Humanities and Social Sciences graduates present more even distribution with respect to their destination in the labor market.

Looking at the flow from the other side, the distribution with respect to the origin (graduating departments) of fresh recruits present various degrees of concentration by industry. More than 90 percent of the new college graduates entering the Trade and the Bank/Insurance industries were graduates from Social Sciences and Humanities departments. In contrast, of the fresh recruits to the Primary and Secondary Sector, 47 percent were from Engineering departments and 34 percent were from Social Sciences departments. Services/Transport industries also present less degrees of concentration.

TABLE 5

Association between the Field of Study and the Sector of Employment

- University, 1990 -

	All Sectors	Primay & Secondary Sector	Tertiary Sector				
			Trade	Bank/ Insurance	Services/ Transport	Govern- ment	Others
Number of Employed Graduates							
Humanities	47,950	9,875	8,580	5,896	19,782	3,460	357
Social Sciences	138,176	34,426	29,840	29,738	27,601	15,666	905
Natural Sciences	9,253	4,217	326	600	3,455	397	258
Engineering	65,015	47,395	2,330	1,797	10,248	2,910	335
Health-Related	9,802	3,555	742	73	5,155	259	18
Education	25,458	2,267	1,357	1,188	19,058	1,491	97
Percent Distribution (%)							
Humanities	100.0	20.6	17.9	12.3	41.3	7.2	0.7
Social Sciences	100.0	24.9	21.6	21.5	20.0	11.3	0.7
Natural Sciences	100.0	45.6	3.5	6.5	37.3	4.3	2.8
Engineering	100.0	72.9	3.6	2.8	15.8	4.5	0.5
Health-Related	100.0	36.3	7.6	0.7	52.6	2.6	0.2
Education	100.0	8.9	5.3	4.7	74.9	5.9	0.4
Percent Distribution (%)							
Humanities	16.2	9.7	19.9	15.0	23.2	14.3	18.1
Social Sciences	46.7	33.8	69.1	75.7	32.4	64.8	45.9
Natural Sciences	3.1	4.1	0.8	1.5	4.1	1.6	13.1
Engineering	22.0	46.6	5.4	4.6	12.0	12.0	17.0
Health-Related	3.3	3.5	1.7	0.2	6.0	1.1	0.9
Education	8.6	2.2	3.1	3.0	22.3	6.2	4.9

Source: School Fundamental Survey, 1991.

Chapter 2

SUPPLY AND DEMAND OF GRADUATES

This chapter focuses upon the supply of, and the demand for, graduates from higher education institutions. Section 1 reviews trends in employment condition in terms of employment rates and relative wage levels; Section 2 analyzes the sources of demand for higher education graduates with respect to the shift in industrial structure; Section 3 offers tentative analyses on the process of supply-demand interaction in the past; and Section 4 speculates on direction of future changes by analyzing corporate needs for the graduates.

1. EMPLOYMENT CONDITION FOR NEW GRADUATES

Supply of the Graduates

In 1990, about 1.4 million new graduates from various levels of schools obtained regular jobs in Japan (TABLE 6). About one-half (54 percent) of these young people were graduates from higher education institutions, and one-quarter (25 percent) were graduates from four-year institutions or graduate courses. Indeed, higher education graduates were by no means a small group of selected few among fresh recruits. The proportions of higher education graduates were almost equal between males and females, but the share of four-year institutions or above was greater for men (37 percent) than for women (13 percent). College graduates are by no means a small group of selected few.

Looking over the last three decades, the size of the flow from higher education has grown tremendously following the enrollment expansion. As FIGURE 4 demonstrates, the total number of graduates from universities started growing in the 1960s, and accelerated in the early 1970s as the postwar "baby-boom" generation

TABLE 6

New Graduates Who Went into Employment by Education Level, May 1990

	Number of Recruits			% Distribution		
	Total	Male	Female	Total	Male	Female
All Levels	1,413,042	707,728	705,334	100.0	100.0	100.0
Junior High School	39,896	27,997	11,899	2.8	4.0	1.7
High School	607,656	299,220	308,436	43.0	42.3	43.7
Post-Secondary	765,490	380,511	384,999	54.2	53.8	54.6
Graduate School	22,597	20,488	2,109	1.6	2.9	0.3
University	331,471	241,201	90,270	23.5	34.1	12.8
Junior College	181,131	10,865	170,266	12.8	1.5	24.1
Technical College	7,759	7,396	383	0.5	1.0	0.1
Special Training School a)	222,532	100,561	121,971	15.7	14.2	17.3

Note: a) Estimated from the number of graduates in 1990 and assuming employment rate of 89.75% derived from 1987 Survey on Special Training Schools.

reached the age of graduation. Even though the rate of growth decelerated somewhat in the late 1970s, it reached the level of around 360 thousand per year by 1980. Since then, reflecting controlled enrollment since the mid 1970s, the number of graduates has been stagnating. The number of graduates from Junior Colleges followed a similar pattern. It is now stable at around the level of 200 thousand. Meanwhile, students of Special Training Schools started graduating in late 1970s. Since then it has grown vigorously, to reach 266 thousand by 1990.

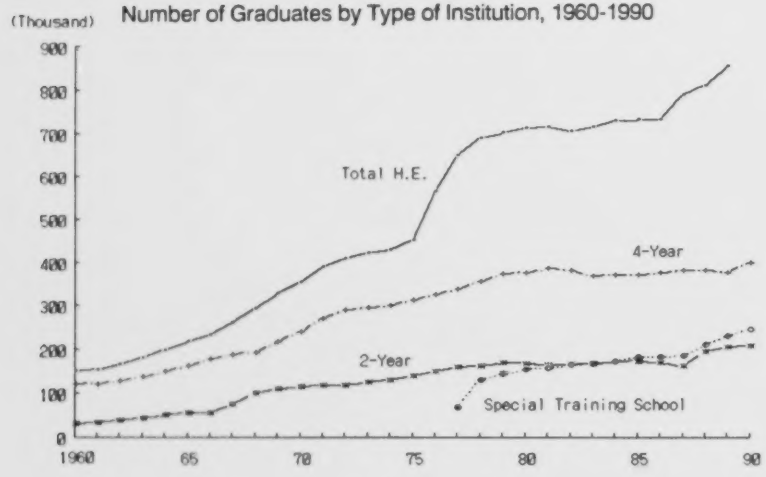
As a whole graduates from higher education institutions increased from 150 thousand to well over the 800-thousand level, or by as much as five times within the period of thirty years. It is impressive that, after the tremendous expansion of the supply of graduates, their employment conditions do not necessarily appear to be dismal at present. How were the new graduates absorbed into the labor market each, and how did the link between higher education and the labor market change over the period? The following sections of this Chapter shall investigate this issue from several aspects.

Trends in Direct Advancement/Employment Rate

It was noted above that an important source of information about employment status of college graduates is a survey undertaken annually by the Ministry of

FIGURE 4

Number of Graduates by Type of Institution, 1960-1990



Source: School Fundamental Survey

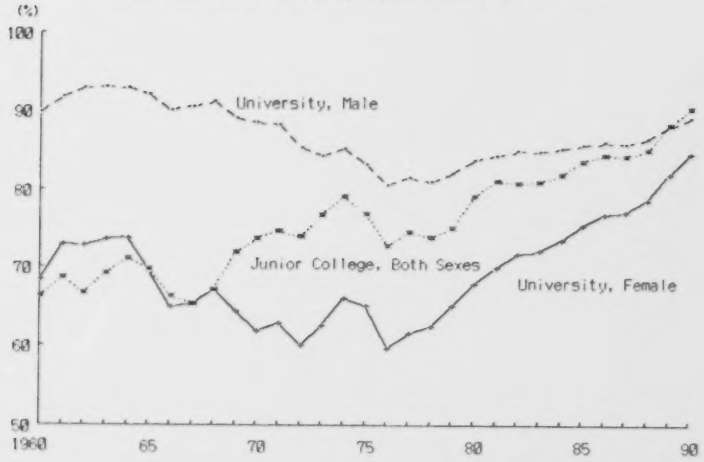
Education. The survey categorized the status of graduates into four classes, i.e. "further education," "employed," "temporary work," and "unknown." In the following paragraphs we focus upon the combined proportion of those classified as "employed" and "further education," otherwise called the "direct advancement/employment (d.a.e.) rate." It should be noted that, because of the method of survey, the proportion of "employed" may under-estimate of the actual rate of employment. Nonetheless, the d.a.e. rate is useful as a rudimentary indicator in examining long-run trends of employment conditions of higher education graduates.

FIGURE 5 presents the changes in d.a.e. rates. For male university graduates, the d.a.e. rate reached the 95-percent level in the first half of the 1960s. This was a period when the number of college graduates were still limited even though the economy was already entering the stage of unprecedented growth. In the following period, the d.a.e. started a gradual decline as the size of college graduates grew. The trend of decline accelerated in the mid-1970s when, on the one hand, the number of college graduates increased substantially, and the economy underwent a painful restructuring in the wake of the oil crisis. As a consequence, the d.a.e. rate fell almost to the 80-percent level. The declining trend, however, was reversed in the late 1970s, and the employment status has shown a gradual recovery. Recently the rate has reached again the 90-percent level. It should also be observed that despite the cyclical changes in over-all employment status, the share of graduates entering graduate courses has been increasing steadily, from around 4 percent in early 1960s to the present level of 8 percent.

For female graduates, the d.a.e. rate stayed around the 70-percent level in the 1960s. Indeed, the prospect for obtaining proper job after graduating from university was bleak for a typical female student in that period. Moreover, obviously the same factors as the case of males affected employment condition for female graduates. The d.a.e. late further declined to the 60-percent level by the mid-1970s. Then, recovery took place as was observed with male graduates. The d.a.e. rate rose consistently since late 1970s to approach the 90-percent level by 1990. There is, however, a significant difference in the statistics between male and female graduates. The increase since the late 1970s was much more vigorous for females than for males. As a consequence, the gender gap in d.a.e. rates shrank substantially over the whole period, from 22 percent-points (68 vs. 90 percent) in 1960, to only 6 percent-points (82 vs. 88 percent) in 1989.

FIGURE 5

Direct Advancement/Employment Rate, 1960-1990



Source: School Fundamental Survey

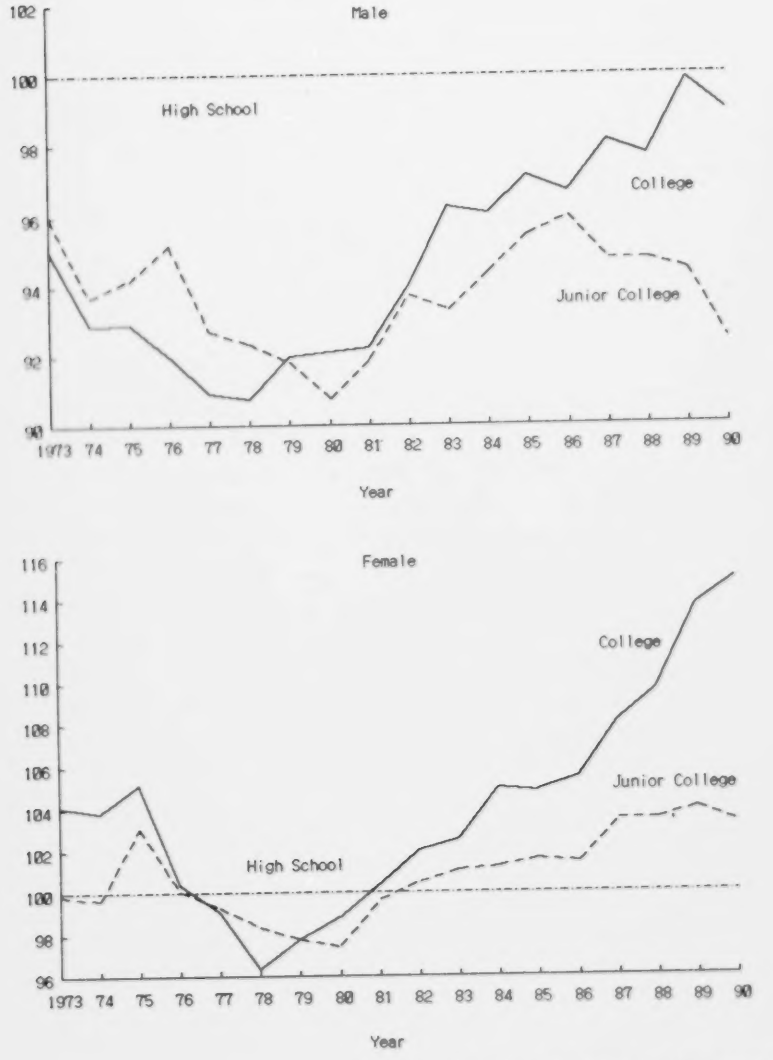
The long-range trend towards improved job prospects appears more pronounced with graduates from junior colleges, of whom more than 90 percent are women. Since the proportion of graduates who transferred to 4-year institutions have been small, changes in d.a.e. rate roughly represent the proportion of those who went into employment directly after graduation. The d.a.e. rate increased substantially over the three decades, from around the 50-percent level in the beginning of the 1960s to almost the 90-percent level by 1989. It is evident that the general deterioration of graduate labor market in the mid-1970s did have some effect on junior college graduates, but its magnitude appears to have been much less than those observed with the graduates from universities.

Changes in the Relative Wage Levels

The relation between demand and supply of higher education graduates should be also reflected in their starting wage, relative to high school graduates of similar age. Using data from the Fundamental Wage Survey, the average wage level of college-educated workers age 20-24 was divided by the wage level of high school graduates in the same age bracket to derive an index of relative wage. A time-series of this index was produced and presented in FIGURE 6. Because of problems in the original data, the Figure only covers the period after 1972.

FIGURE 6

Changes in Relative Wage Index by Education - High School Graduates = 100 -



Source: Wage Census, various years.

The upper half of the figure presents the changes for male college graduates. It should be noted that, in the 20-24 age bracket, the relative wage ratio can be lower than 100, indicating that college-educated workers are paid slightly lower than high school graduates. That is because at this age high school graduates have already accumulated several years of work experience, whereas college graduates have just started working. It is only after the college graduates have worked several years that their average wage surpasses that for high school graduates of the same age.

Observing the figure over time, one should notice the downturn towards the end of the 1970s. An analysis of relative wage in the earlier period indicates that the decline had started in mid-1960s [Kaneko 1987]. The downward trend obviously continued from the 1960s to the 1970s. From 1973 to 1978, the relative wage index for university graduates declined from 95 to 91. At the end of the 1970s, however, the index started rising again and reached 98 by the late 1980s. The upward trend has continued, and the most recent data indicates that this index stands now almost at 100. The change in relative wage index thus draws a pattern of change to that observed with d.a.e. rate of male university graduates.

It is also the case with female graduates. Specifically, female graduates from four-year institutions draw a pronounced pattern with an even greater magnitude of fluctuation. During the downturn phase of the 1970s, there was a decline of 10 points, while the upturn saw a rise of 13 points. The change for junior college graduates was more subdued. The same factors of supply and demand affecting male graduates are considered to be behind the pattern observed with female graduates. The greater fluctuation in the change pattern of female university graduates is arguably indicating of their marginal status in the labor market. One should remember, however, the size of newly employed female college graduates has increased tremendously over this decade. In this aspect, there has been, quite apart from the cyclical changes, a distinctive structural shift in the supply-demand relationship for female university graduates.

The relative wage indices for graduates short-cycle institutions (i.e. junior colleges, Special Training Schools, and Technical Colleges), either for males or females, draw an essentially similar pattern to that of university graduates, except that the extents of fluctuation is relatively small. There are, nonetheless, distinct characteristics. In the latter half of the 1980s, relative wage indices stopped rising. It has declined again for male graduates, and started stagnating for female graduates. Meanwhile, the gaps with university graduates have grown substantially. To an extent, it reflects the change in supply. Until the mid-1970s, males in this educational categories had been small in number, and most of them graduates from either

Technical Colleges or technical courses of junior colleges. Since mid-1970s, a large number of graduates from Special Training Schools, with various specialization and qualification, have joined the group. Also for females, the growth of graduates from Special Training Schools resulted in an increase of the total number of graduates from short-cycle higher education. It should be remembered, however, that d.a.e. rate for junior college graduates kept rising in the same period. Probably more structural explanation will be needed.

Trends by Field of Study

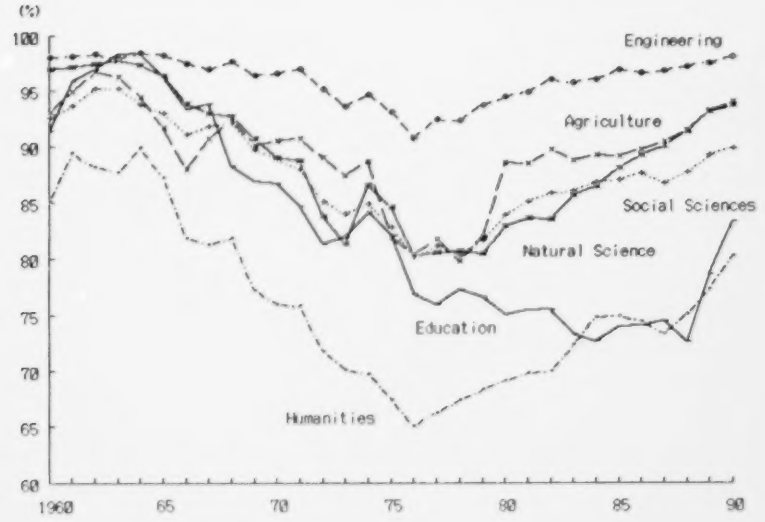
The over-all pattern of change in job prospects described above has affected almost all fields of study. But, variation by individual field of study was substantial.

The changes in direct advancement/enrollment (d.a.e.) rate for male university graduates from different fields of study are presented in FIGURE 7 and in Appendix Table B-5. It is evident that least affected were the graduates from Engineering departments. In the beginning of the 1960s, the d.a.e. rate was as high as 98 percent and, even though the general decline did affect these graduates, the d.a.e. rate still remained above the 90-percent level. With the following recovery, the rate once again rose to 98 percent by the end of the 1980s. Other NSE fields were affected by the general trends to greater degrees. The d.a.e. rate for graduates from the Natural Sciences or the Agriculture departments fell to almost the 80-percent level in the mid-1970s, before recovering beyond the 90-percent level in the late 1980s. The HSS fields presented greater ranges of fluctuation. The d.a.e. rate for the Social Sciences departments went up to 95 percent in early 1960s, fell to 80 percent in mid-1970s, and rose to almost the 90-percent level in the latest statistics. Humanities graduates experienced a depression of even a worse degree. After the 90-percent level in the early 1960s, it plunged to 65 percent. Even after the recovery of the 1980s it has yet to reach the 80-percent level. Among HWE fields, graduates from Health-Related departments present a similar pattern to Natural Sciences graduates, with the d.a.e. rate declining from 98 percent to below the 80-percent level, and then recovering almost to the 90-percent level. The only exception to the general trend is Education graduates. The d.a.e. rate, having been as high as 98 percent in early 1960s, started declining in the 1960s, and did not recover in the 1980s as other fields. Obviously, this reflects the changes in demand for new teachers.

For female university graduates, the changes in d.a.e. rate are presented in FIGURE 8 and in Appendix Table B-6. Female graduates from the NSE fields, though a minority, enjoyed favorable employment prospects even in the early 1960s.

FIGURE 7

Direct Advancement/Employment Rate by Field of Study - University, Males



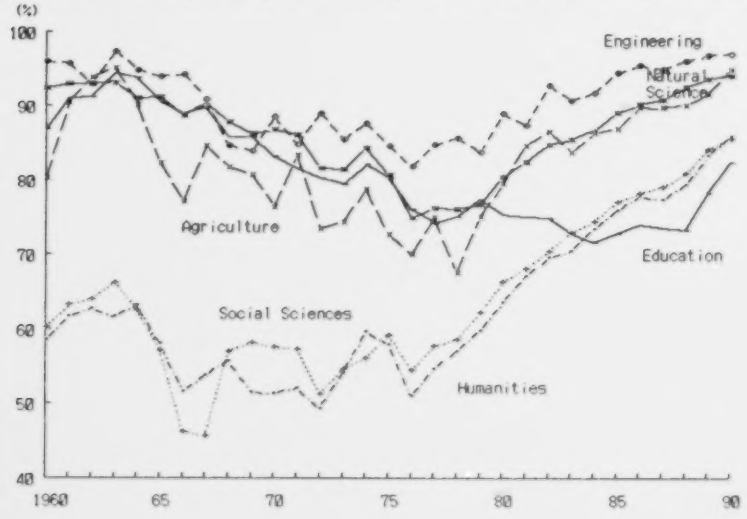
Source: Appendix Table B-5

In the 1970s, they experienced far worse employment opportunities than their male counterparts. However, with the recovery since the end of the 1970s their d.a.e. rate has risen well beyond the 90-percent level. Meanwhile, female graduates from the HSS fields, who constituted the majority, had to suffer from poor employment prospects. Specifically, the d.a.e. rate for Humanities graduates stayed around the 60-percent level in the 1960s, and fell even further to around the 50-percent level in the 1970s. Nonetheless, since the late 1970s, it has shown a steady, rapid rise, and by the end of the 1980s passed the 80-percent level. A similar pattern can be observed with Social Sciences graduates. In contrast, graduates from HWE fields enjoyed favorable employment conditions in the 1960s, but the recovery after the plunge of the mid-1970s has been less vigorous. This trend is particularly pronounce with Education graduates. Their d.a.e. rate passed the 90-percent level in the 1960s, then declined in subsequent years to almost the 70-percent level, without much recovery in the 1980s.

On the whole, the variance in d.a.e. rate across fields of study for female graduates has become substantially smaller in recent years. This is in sharp contrast to male graduates with which the corresponding variance has become greater.

FIGURE 8

Direct Advancement/Employment Rate by Field of Study - University, Females



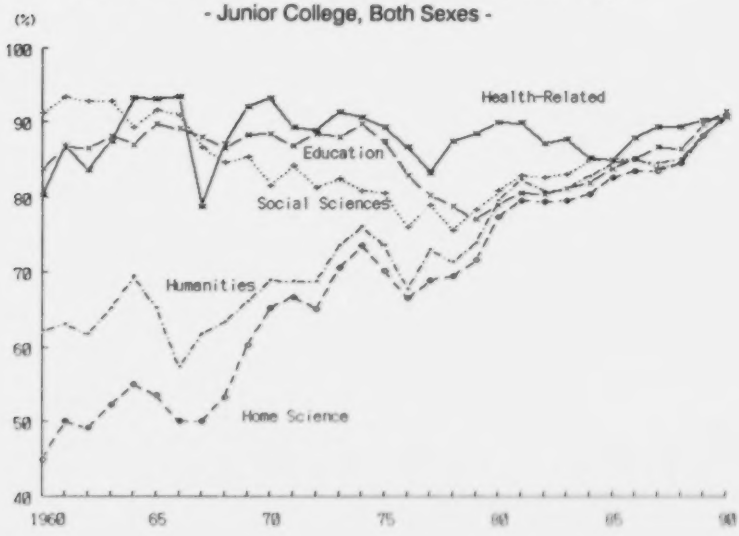
Source: Appendix Table B-6

The d.a.e. rates for junior college graduates present a remarkable pattern of change over time, as observed in FIGURE 9 and in Appendix Table B-7. In the 1960s, Education graduates who became preschool and primary school teachers enjoyed good job prospects. Graduates from Health-Related departments also enjoyed favorable job opportunities, as indicated by the d.a.e. rate ranging around the 90-percent level. Meanwhile, employment condition for other departments was much less promising. Typically, Home Sciences departments, considered by many to be preparatory schools for women to become good housewives, reported rather break d.a.e. rates for their graduates of below the 50-percent level in the 1960s. The situation, however, improved gradually in subsequent years. By 1989, the d.a.e. rate has reached the 90-percent level. Social Sciences and Humanities graduates, who traditionally faced slightly better employment prospects than the Home Sciences graduates, nevertheless followed essentially similar patterns of change. Consequently, the large variance in d.a.e. rate among fields of study as observed in the 1960s has become almost negligible with d.a.e. rates converging at around the 90-percent level. The only exception was Education graduates, whose d.a.e. rate has remained at around the 80-percent level. The tendency towards convergence is similar to that found with female graduates from 4-year institutions. It should also be noted that the

FIGURE 9

Direct Advancement/Employment Rate by Field of Study

- Junior College, Both Sexes -



high d.a.e. rates for female graduates do not necessarily imply that they will stay on the job. So far, a good majority of them leave the work after marriage or the birth of child.

From the observations above, it can be argued that there were three factors behind the changes of the last three decades. (i) The relative position of over-all supply and demand of higher education graduates. In the 1960s and in the first half of the 1970s, excess supply dominated the market. Since then, it turned into the condition of excess demand. There are indications, however, that the magnitude of excess demand has become weak in last few years with graduates from short-cycle institutions. (ii) The field specific factors, representing supply-demand relation in each specific field of study. In the case of Social Sciences and Humanities, the field specific factors tended to exaggerate cyclical fluctuations; with Education, it depressed the employment prospects in the last decade.[4] (iii) The gender factor, which turned out to be positive for women, and consistently positive for women from junior colleges.

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4 It should be noted that changes in d.a.e rate can reflect many factors. It is probable that the negative individual field factor found with the Social Sciences and the Humanities graduates reflect the fact that many male graduates no longer find job through placement offices and subsequently do not report their employment status to the institution. Likewise, the d.a.e rate for Education departments has been declining partly because many of the graduates found jobs other than as teachers.

2. SOURCES OF THE DEMAND FOR EDUCATED LABOR

To what extent were the changes in employment condition described above affected by the demand for educated labor? In an attempt to approach this question, changes in employment are examined in this section with respect to their relation to the shift of industrial structure.

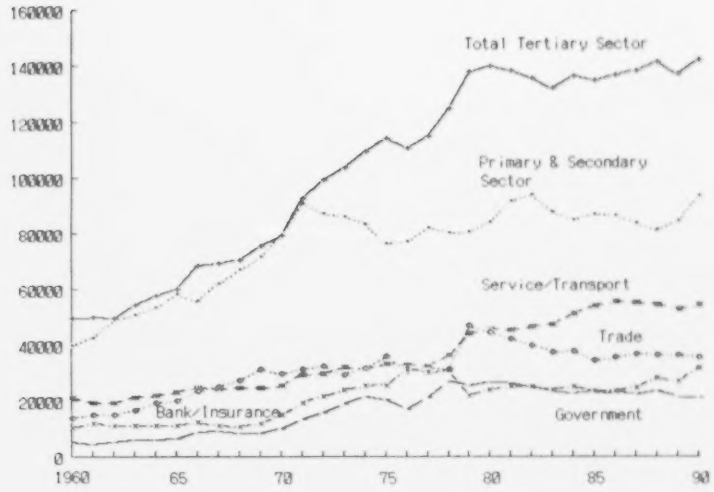
Changes in Industrial Distribution of College Graduates

As an initial step of analysis, we first focus upon the flow of higher education graduates into different industrial sectors.

The long-run trends in the number of male university graduates employed annually in each industrial sector (FIGURE 10) demonstrates that from this perspective the whole period since 1960 to the present can be divided into three distinct phases, each roughly corresponding to individual decade. In the 1960s, the sizes of employment at the Primary & Secondary sector (Agriculture, Fishery, Forestry, Mining, Manufacturing, Construction and Electricity/Gas/Water) on the one hand, and the Tertiary sector (Trade, Bank/Insurance, Services/Transport, Governments) on the other, were almost comparable to each other, and they expanded annually at similar rates. The two sectors employed respectively about 40 and 50 thousand graduates in early 1960s; by 1970, each employed about 80 thousand. In the 1970s, the annual flow to the Primary & Secondary Sector stagnated with some fluctuation in the range between the 70- to 90-thousand level, but the flow into the tertiary sector continued increasing, to reach the 140-thousand level by 1980. In the 1980s, the levels of flow into the two sectors have been stable.

As noted above, female university graduates employed immediately after graduation increased tremendously. The changes in employment draw a different pattern from that for male graduates (FIGURE 11). In 1960, the employed female graduates numbered about 10 thousand altogether, of which as much as 84 percent were employed at the Tertiary sector. Most of these graduates went into teaching professions. But, employment expanded steadily over the following three decades. Especially the expansion of employment at the Tertiary sector has been remarkable, from less than 10 thousand in 1960 to 70 thousand in 1990. Particularly in the 1980s, employment increased not only in Services/Transport, but also in Trade, Bank/Insurance, and Governments. Meanwhile, graduates employed at Primary & Secondary sector increased especially in the 1980s. By the end of 1980s, they numbered 17

FIGURE 10
Employed Graduates by Industrial Sector
- University, Males, All Fields of Study -



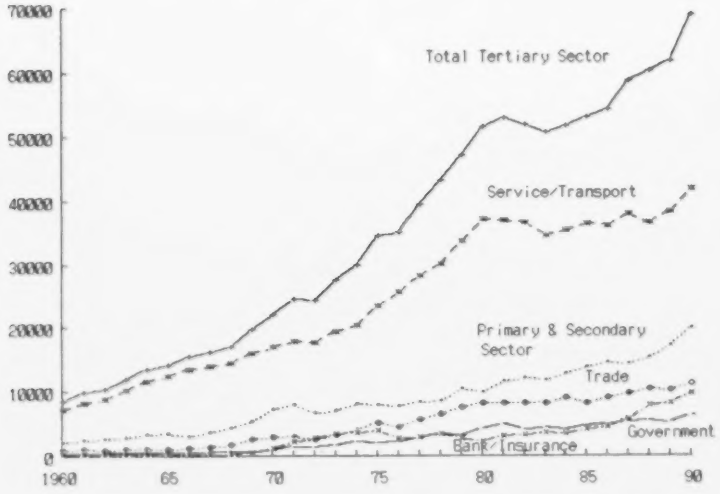
Source: Appendix Table C-2

thousand. Now, the Primary and Secondary sector accounts for more than 20 percent of the total employment of female graduates. Hence, as employment opportunities for female graduates did not only increased in number but also expanded the scope.

How were the graduates of each field of study employed by different sectors, and how has the pattern of distribution changed over time? Looking at the data (Appendix Tables C-5 through C-10) from this perspective offered a few insights.

There has been a secular trends in the distribution of Social Sciences graduates and Engineering graduates. In the case of Social Sciences graduates, once can observe a slight decline in the proportion accounted for by the Primary & Secondary Sector on the one hand, and a slight increase in the proportion entering the Services/Transport industry. As a result, graduates from the Social Sciences departments now present a more even distribution than thirty years ago. Similar trend of diversification can be found with Engineering graduates. The proportion of those entering the Primary & Secondary sector has been steadily decreasing, while those entering the Services/Transport industry has been expanding.

FIGURE 11
Employed Graduates by Industrial Sector
- University, Females, All Fields of Study -



Source: Appendix Table C-3

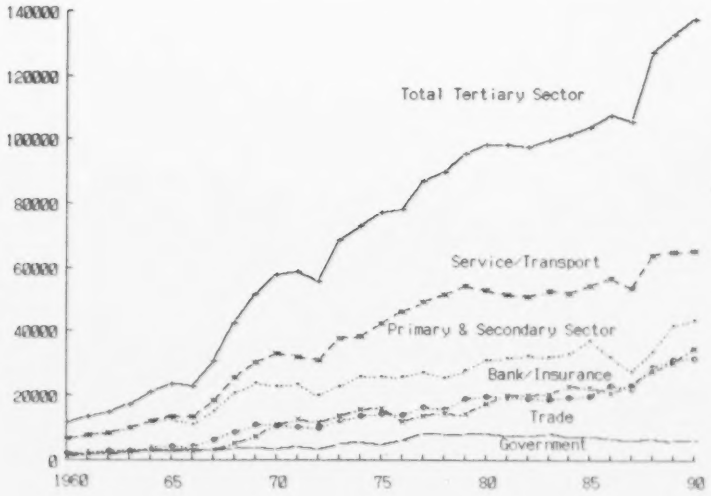
The distribution of the Humanities graduates appears to have been fluctuating. To an extent, the fluctuation reflects the fact that the Humanities graduates substitute Social Sciences graduates. At least in the 1980s, however, the distribution has become more diverged. The share of Services/Transport, their traditional destination, that of Governments declined. On the other hand, the shares of Primary & Secondary sector and Bank/Insurance industry increased. Education graduates show a distinctive trend of diversification. The share of Services/Transport steadily declined, while that of the other sectors increased over the thirty-year period. Moreover, particularly in the 1980s the distribution within the Services/Transport industry shifted, reflecting a substantial decrease of those who became teachers and an increase entering other services industries.

The number of employed graduates from junior colleges has been increasing steadily over last three decades (FIGURE 12). In 1960, only 18 thousand graduates entered employment; by 1989 the number increased almost ten-fold to 174 thousand.

FIGURE 12

Employed Graduates by Industrial Sector

- Junior College, Both Sexes, All Fields of Study -



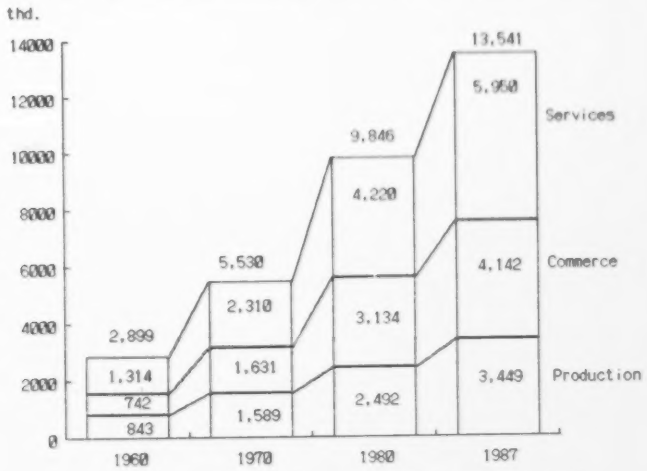
Source: Appendix Table C-4

It is evident that the expansion is largely attributable to the increased employment opportunity in the tertiary sector. Particularly the Services/Transport industry has been the largest destination for the graduates from two-year institutions. This reflected the large demands for teachers at preschools and primary schools. In the 1980s, while demands for teachers declined, other industries in the tertiary sector, i.e. Trade and Bank/Insurance industries, as well as the Primary & Secondary sector have been expanding their intake rapidly. It is mainly the expansion of clerical jobs for female workers in these sectors that contributed to the increased employment opportunities for two-year college graduates.

On the whole, employment of university and junior-college graduates expanded in various industrial sectors. It is important to note that with the expansion, tradiational associations between a particular field of study and a particular industry have been weakened. Graduates tend to be distributed over different industrial sectors more evenly than before.

FIGURE 13

Changes in the Size of H.E. Graduates in Labor Force by Industrial Sector



Source: Estimated from 1960, 1970, 1980 Census and 1987 Labor Force Survey

Changes in Educational Composition of the Labor Force

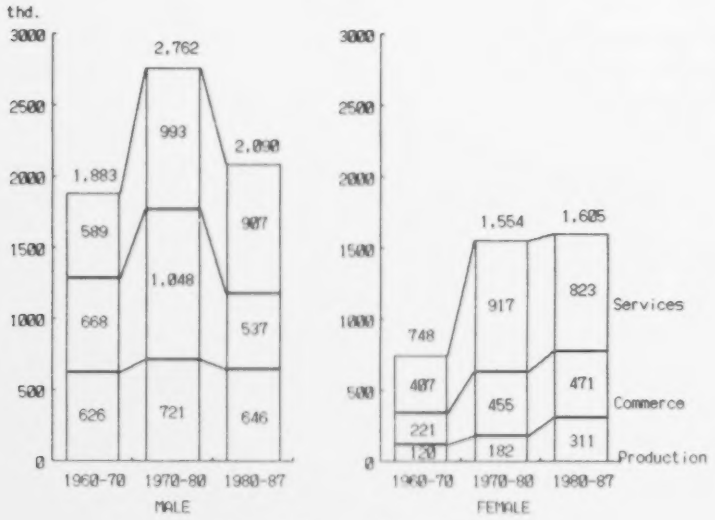
The analysis above focused upon employment of new graduates. Underlying it, however, is the demand and supply of not only new graduates but of the educated labor force as a whole. We therefore move on to the stock, rather than flow, of higher education graduates.

In 1960, college-educated workers numbered only about 2.9 million, or 5 percent of the total labor force. In less than three decades the size increased 4.7 times. In 1987, there were 13.5 million workers with higher education, accounting for 22 percent of the total labor force. Where in the industrial structure were the tremendous number of higher education graduates absorbed in such a short period?

The changes in college-educated labor force by industrial sector are presented in FIGURE 13. In 1960, the Primary & Secondary Sector employed 843 thousand workers with university or junior college education. By 1987, that number multiplied by a factor of 4.1. While the rate of increase was tremendous in itself, it was comparatively lower than the increase in the total college-educated labor force. Consequently the share of the Primary & Secondary Sector shrank from 29 to 25 percent over the period between 1960 and 1987. Meanwhile, the Commerce Sector

FIGURE 14

Contribution of Industrial Sectors to the Increase in H.E. Graduates in the Labor Force



Source: Same as Figure 13

(Whole Sale-Retail, Bank-Insurance and Transportation) expanded its college-educated work force by as much as 5.6 times in the same period, thereby increasing its share from 26 to 31 percent. The most significant employer of college graduates remains to be the Services Sector (Business and Personal Services and Government). Its share has been stable since 1960 at around the 45 percent level. Over-all, the total number of college-educated labor force increased by 10,642 thousand from 1960 to 1987. Of the increase, 44 percent was accounted by the increase in those working in the Services Sector, 32 percent in the Commerce Sector, and the remaining 24 percent in the Primary & Secondary Sector.

The pattern of relative contributions by industrial sector to the increase in employment of college-educated labor force has been shifting over time. FIGURE 14 demonstrates that in the 1960-1970 period, each of the three sectors contributed almost evenly to the expansion of employment of male college graduates. In the following 1970-1980 period, it was the Commerce and the Services industries that contributed to the magnitude of expansion. The Primary & Secondary Sector, however, appears to have lost its momentum in the 1980s. As for female university graduates, more than half of the expansion was attributable to the Services Sector.

The pattern did not change over the three periods. It is remarkable, especially in contrast to the case of male university graduates, that the Primary & Secondary Sector has been steadily increasing its rate of expansion.

Factor Decomposition Analysis

Theoretically, an increase of higher education graduates in each industrial sector should have been caused by two factors. First, expansion of total employment, including less educated labor, in that sector should bring about the increase of higher education graduates even if their relative share remains the same. Second, substitution of less educated labor by higher education graduates causes an increase in higher education graduates even if the size of total enrollment in that industrial sector remains the same. To what extent were the past increases in employed higher education graduates attributable to each of the two factors?

In order to approach this problem, a factor decomposition exercise was undertaken, focusing on the period between 1977 and 1987. Expressed in mathematical terms, it can be written as

$$\Delta L_e = \sum (L_{ie}/L_i) * \Delta(L_i/L) \quad \ldots(a)$$
$$+\sum \Delta(L_{ie}/L_i) * (L_i/L) \quad \ldots(b)$$
$$+\sum \Delta(L_{ie}/L_i) * \Delta(L_i/L), \quad \ldots(c)$$

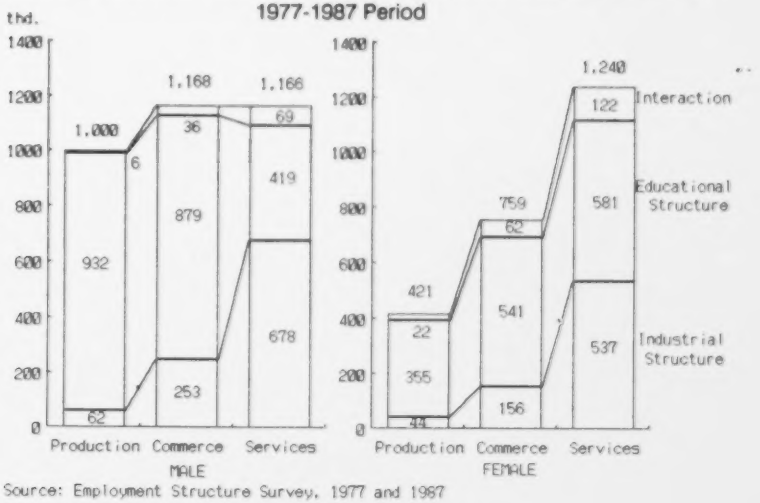
where L_{ic} signifies the size of employment with suffix i standing for industry and suffix e for educational background. The first term (a), corresponds to the effect of the increase in the size of the i'th sector, may be called the "sector size effect." The second term (b), representing the effect of the upgrading of the educational qualification of the i'th sector, may be called the "educational upgrading effect." (c) stands for the interaction of the two factors. FIGURE 15 summarizes the results from this exercise. The results of more detailed analysis are presented in Appendix Tables C-12 and C-13.

For male college graduates, the increase was almost even among the three industrial sectors. Over the 1977-87 period, college-educated labor increased by 1.0 million in the Primary & Secondary Sector, by 1.2 million in the Commerce Sector and by 1.2 million in the Services Sector.[5] However, the factors behind the expansion were quite different. Employment of college graduates in the Primary & Secondary Sector expanded primarily due to an increase in the proportion of college graduates in the sector. In other words, replacement of lower educated labor with college

5 In this exercise the industrial classification is slightly different from the one used earlier. Government is included in The Commerce Sector, not in the Services Sector.

FIGURE 15

Contributing Factors to the Increase in the Employment of H.E. Graduates in 1977-1987 Period



Source: Employment Structure Survey, 1977 and 1987

graduates was the main reason for the increase of college graduates in the sector. In contrast, about 60 percent of the increase in the Services Sector was attributable to the increase in the size of employment in the Services Sector itself. Because the share of higher education graduates in the Services Sector had been high, the rapid expansion of the sector itself created a large demand for higher education graduates. The Commerce Sector showed a pattern in between the Primary & Secondary and the Services Sectors, with the effect of sector size accounting for 22 percent of total increase.

Expansion in employment of female higher education graduates was distributed unevenly among Industrial Sectors. In the Services Sector, the employment of female college graduates increased by 1.2 million. The magnitude even slightly surpassed that for male. In the Commerce Sector, the increase was 76 thousand, and in the Primary & Secondary Sector it was only 420 thousand. As was the case for male, the expansion in the Primary & Secondary Sector was predominantly due to educational upgrading. Meanwhile, both the educational upgrading effect and the sector-size effect contributed almost the same to the increase in female college graduates in the Services Sector. It reflects the change in nature of work for female workers in the Services Sector changed in this period. As for the Commerce Sector, the educational upgrading effect played a significant part, accounting for 70 percent of the total increase, but the contribution of sector-size effect was not negligible.

3. SUPPLY-DEMAND INTERACTION

The analysis above revealed a few aspects of the changes in employment of higher education graduates. Better understanding of the mechanism linking supply and demand calls for more systematic analysis, which is beyond the scope of the present study. However, an attempt is made below by tentatively speculating how the two factors interacted in the last three decades.

Phase of Excess-Supply - 1960 through mid-1970s

Observation about direct advancement/employment rates and relative wage levels in Section 1 revealed that, with respect to employment condition, the period between 1960 and 1990 can be divided into two sub-periods. The first sub-period, covering the 1960s and the early 1970s, was characterized by long-run deterioration in employment condition.

Over this period, the Japanese economy experienced very rapid economic development, with GNP growing annually at an average rate of around ten-percent in real terms. On the one hand, the economic growth brought about steady increases in household income. It induced new demand for the opportunities of higher education, thus expanding enrollment of higher education institutions and subsequently the supply of higher education graduates. On the other hand, growing business firms necessitated higher education graduates of various capacities, thus expanding demand for higher education graduates. The moves of d.a.e. rates and other indices indicate that the magnitudes of the two factors were balanced in the early 1960s, but at mid-1960s the growth of supply started outpacing supply. This rendered the basis of deterioration in employment condition of college graduates as a whole. There were, however, considerable differences in this regard by field of study or by gender.

Graduates from the NSE field were least affected by the general trend of declining employment status described above. The economic growth of the 1960s was lead by unprecedented development in the manufacturing sector. It naturally created a tremendous demand for engineers and scientists, who had to be recruited from higher education institutions. In fact, the Economic Plan adopted in 1960 specifically pointed out the need for expansion of the NSE departments. The Ministry of Education took various steps to expand the NSE courses in national and private

institutions. Those policy measures succeeded eventually in increasing enrollment in those courses, but it naturally took some time before the students graduated and entered the labor market.

For HSS graduates, the expansion of the manufacturing sector implied increases in management and clerical positions. Also, the increased number of workers from middle schools entailed the need for supervisors. But, more important, the economic growth induced an expansion of the Tertiary Sector; managing positions at business enterprises in trading, financing, and other tertiary sector industry grew rapidly. These factors created a considerable increase in demand for college graduates to fill positions that had traditionally been filled by Social Sciences graduates. Nonetheless, the growth in demand was far exceeded by the increase in the number of Social Sciences graduates. As a result, many graduates sought employment at small-scale corporations that had never hired college graduates before. In those corporations the jobs of college graduates and that of other workers were less formally differentiated. It was here that the link between Social Sciences courses and managing or supervisory jobs was loosened considerably.

The loosening of the link was most serious with Humanities graduates. Their traditional destination was teaching positions at lower- and upper-middle schools. The demand for school teachers grew substantially in the 1960s due both to the increasing enrollment rate at those schools and to the increase of the size of school-going cohort. But the increase in the demand was increasingly catered to by graduates from Education departments, whom the education community preferred. Some graduates sought employment opportunities with some relation to what they learned, such as publishing and mass-media. But employment opportunities in that segment was small relative to the increased supply. Consequently increasing numbers of Humanities graduates found opportunities in small scale corporations. Also female students were discouraged by the labor market and chose to seek temporary work or stay home.

As a consequence of the excess supply, the wage level for university graduates relative to high school graduates decreased particularly at young age brackets. That implied a decrease in the rate of return to individual investment on university education. Nonetheless, popular demands for the opportunities for higher education did not stop expanding, presumably because the positive effect of growing family income was large enough.[6]

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6 For a detailed analysis of the rate of return to education and discussion about factors of enrollment expansion over this period, readers are referred to [Kaneko, 1987].

Eventually in the mid-1970s the employment condition plunged to its worst level. This can be explained from both supply and demand sides. The supply of college graduates had been increasing over the years primarily because of the steady growth in enrollment rates. But in the late 1960s, the "baby-boom" cohort started reaching 18-years of age. The size of enrollment grew, and they started entering the labor market by the beginning of the 1970s, thus flooding the labor market. On the other hand, the epoch of rapid economic growth drew to an end with the floating of the exchange rate for the U.S. dollar (1971). Business firms became cautious about their future expansion of business and employment. Finally in 1974, the "Oil Shock" forced the accumulated problems to erupt. The Japanese Economy went into a period of structural reorganization, and business firms tried to shed over-capacity in both physical equipment and workforce. These factors collaborated to cause the depression in the employment condition in almost every field of study, including the NSE courses.

Shift to Excess-Demand - Mid-1970s to the Present

The employment condition started recovering in the late 1970s, and continued improving to date as observed with d.a.e. rates and relative wage indices. The trend again can be explained basically in terms of both supply and demand of college graduates.

On the supply side, the number of college graduates entering the labor market stabilized due to the governmental policy controlling the expansion of higher education institutions. Frustrated demands for higher education was channelled to the newly created Special Training Schools. On the demand side, the economy went into a course of steady recovery by the end of the 1980s and the growth path of the economy shifted structurally towards the tertiary sector. From a microscopic aspect, large scale corporations that had concentrated on "restructuring" their operations by paring obsolete operations gradually started expanding again, frequently entering new fields. At the same time, numerous business firms started expanding in the services sector. It is also important to note that technological progress did not only changed production process, but also transformed administrative and managerial works. As the previous sections demonstrated, these factors on the one hand caused expansion of various services sector jobs that require higher education graduates, and on the other encouraged substitution of less educated labor with higher education graduates, thus augmenting the over-all demand for higher education graduates. But, again, the situation varied substantially by the course of study and by gender.

For NSE graduates the recovery came promptly. But it should be noted that there was a clear difference by specific fields of study, particularly in Engineering. Because of the redirection of the economy, heavy- and chemical-industries in general faced slowed growth. Meanwhile, such fields as electronics and bio-technology started expanding at a phenomenal rate. As a consequence, the demands for engineers shifted. It does not necessarily imply that the graduates from departments of less popular subjects have faced difficulties in obtaining a job. NSE graduates in almost any field are still popular among employers because of their basic qualities. Employers hire those graduates and retrain through in-house training. For more specialized engineers, there have been growing demand for graduates with Master's Degrees. Corresponding to this shift in demand, the rate of advancement from undergraduate to graduate courses has been rising rapidly since around 1980.

For Social Sciences graduates the employment condition improved considerably. Since the mid-1970s the Tertiary Sector of the economy expanded vigorously. One of the factors was the further integration of the Japanese economy into the world economy, which induced substantial growth in the trading, financing and manufacturing industries operating overseas. Also, large scale retail industries finally started expansion in Japan. These industry necessitated a large number of work force that are able not only in clerical tasks but also in judgement under new environment. The need was directed to the college graduates from the Social Sciences courses. Humanities graduates also faced an improving employment status basically because of the expansion of the Tertiary Sector. But their employment tended to be more concentrated on small scale corporations in business and personal services.

Graduates from Education departments are the only ones experiencing difficulties in recent years. The demand for new school teachers, either at the primary or secondary level, has been declining due both to the decreasing school-age cohort and to the age-structure of the present teachers. It does not imply that the graduates are facing such poor employment opportunities that they do not win any offer. Under the present condition of the labor market, many corporations are willing to recruit college graduates from Education departments. Especially, the software industry is said to be strategically focusing on Education graduates. Nonetheless, many graduates, having chosen the department on the assumption that they would become teachers, feel frustrated.

Female graduates on the whole have been experiencing steadily improving employment status. Some social critics attributed the change to the Equal Employment Opportunity Law enacted in the 1980s. But most experts appear to believe that the improvement was induced by structural changes in the labor market. The severe

shortage of male college graduates in general forced employers to recruit qualified female graduates. Also, the expansion of the Services Sector implied an increase in many new types of jobs. Since recruitment to those jobs did not involve established employment policies that were biased towards males, access was relatively easy for female graduates. As a consequence, many large scale corporations started hiring female college graduates for career-truck positions. The bulk of female graduates, however, were employed small-scale firms in the business and personal services.

There are several indices that indicate that supply-demand relation for higher education graduates may have entered a still new stage since the latter half of the 1980s. On the one hand, university graduates have been enjoying very good job prospects, and their wage level steadily rising. On the other, for graduates from junior college and Special Training School there have been still abundant job-offer, but their wage level has started stagnating or even declining relative to high school graduates. To an extent the difference may be attributable to the stable supply of university graduates on the one hand, and on the other the increasing supply of graduates from short-cycle higher education institutions. At the same time, it is conceivable that demand is shifting away from the former and towards the former, as the trend since late the 1980s accelerated.

4. CHANGING CORPORATE NEEDS

The analysis so far concentrated on past changes. What, then, would be the prospect of employment status? In an attempt to assess the future direction, results of questionnaire surveys on corporate managers and some related data are examined below.

Perceived Personnel Shortage and Surplus

A survey of four-hundred large scale business firms asked their human resources managers to assess their present workforce relative to the need. The results (TABLE 7) indicate that severe shortage was felt with Technical and R & D personnel. As much as 69 percent of the respondents answered that there were shortages or even severe shortages of the workers at those jobs, while only 2 percent answered that there were surpluses. In sharp contrast, the perceived shortage was minimal with Primary & Secondary or Operation workers. Only 36 percent of the respondents reported a shortage of these workers, while 26 percent of the respondents

TABLE 7

Perceived Employees Shortage/Surplus by Type of Work Large Scale Firms, 1989

	N. of Responding Firms	Distribution (%)						
		Total	Severe Surplus (1)	Surplus (2)	Balanced (3)	Shortage (4)	Severe Shortage (5)	% Shortage (4)+(5)
All	405	100.0	1.5	12.3	37.0	45.4	3.7	49.1
By Job								
Technical/R&D	360	100.0	0.0	2.0	28.6	50.8	18.6	69.4
Production/Operation	322	100.0	5.7	20.7	37.4	26.3	9.9	36.2
Planning	402	100.0	0.0	2.2	52.0	38.1	7.7	45.8
Sales	396	100.0	0.3	2.5	43.4	47.5	6.3	53.8
Clerical	404	100.0	1.5	22.8	53.7	20.3	1.7	22.0
By Function								
Information Related	383	100.0	0.0	0.5	24.0	56.7	18.8	75.5
Overseas Operation	342	100.0	0.0	0.9	37.7	48.5	12.9	61.4

Source: Keidanren[Japan Federation of Economic Organizations], 'Opinion Survey on Employment Human Resources Strategies to Adopt to the New Changes in Economic and Industrial Structure,' 1989, p.3.

Note: Opinion poll on 421 large scale business firms.

reported surpluses. As for the non-production workers, present employees at Planning or Sales jobs are perceived to be fewer than desirable levels. Even though the proportion of those who felt a shortage (46 percent for Planning and 54 percent for Sales) was more modest than Technical workers, those who perceived a surplus was negligible. Again in sharp contrast, only 22 percent of the respondents reported shortage, while 24 percent reported surplus, of the workers at Clerical jobs. It is remarkable that in both production and non-production jobs, shortage is felt with the workers at jobs that require greater degrees of judgement and knowledge.

Perceived shortage or surplus was also asked in terms of specific field of task. As much as 76 percent of the respondents answered that there were shortages of workers who handle tasks of information processing. Also 61 percent of the respondents perceived shortage of workforce for overseas operation. Obviously, the shortages are felt in the areas corresponding to changes in the field and the ways of handling of corporate activities.

TABLE 8

Number of Responses Predicting Shortage of Graduates by Field of Study

Non-Technical			Technical		
Field	Frequenccy	(%)	Field	Frequency	(%)
Foreign Language	120	61.5	Electricity/Electronics/Communicaion	360	91.4
Law	104	53.3	Information/Computer	339	86.0
Economics	84	43.1	Controlling/Testing	212	53.8
Business	84	43.1	Biology/Bio-Chemistry	148	37.6
Commerce	59	30.3	Mechanical Engineering	136	34.5
Sociology	30	15.4	Physics	130	33.0
Psychology	22	11.3	Theoretical/Applied Mathematics	111	28.2
Social Works	12	6.2	Architecture	87	21.3
Education	9	4.5	Theoretical/Applied Chemistry	83	21.1
Others	6	3.0	Management Engineering	82	20.8
Fine Arts	5	2.6	Agriculture/Bio-Production	70	17.8
Health	2	0.1	Design/Craft	56	14.2
Literature	1	0.1	Medicine/Pharmaceutical	40	10.2
			Civil Engineering	34	8.6
			Metallurgy	23	5.8
			Veterinarian/Animal Husbandry	15	3.8
			Spinning/Weaving	7	1.8
			Geology/Mine	4	1.0
			Ship-Building	3	0.1
			Others	3	0.1
N. of Responding Firms	195	(-)	N. of Responding Firms	394	(-)

Source: Keidanren[Japan Federation of Economic Organizations], 'Opinion Survey on Employment and Human Resources Strategies to Adopt to the New Changes in Economic and Industrial Structure.' 1989, p.11.

Note: The total of percentage does not add up to 100 percent because of plural responses.

The same survey also asked the human resources managers about the types of fresh recruits from college that would be in short supply. The frequencies of responses predicting shortage are summarized by course of study and presented in TABLE 8. Because plural entry was allowed, presented percentages do not add up to 100 points. It was somewhat predictable that graduates from the fields of technological frontiers were considered to be in severe shortage. As many as 91 percent of the respondents felt shortages of the graduates from Electricity, Electronics or Communication courses. Also, 86 percent of the respondents thought that Information or

Computers specialists are in short supply. It deserves attention, however, that the percentages were much lower for the graduates from other fields of NSE.

Among the HSS fields, shortage in Law graduates was perceived by 53 percent of the respondents, and in Economics and Business graduates by around 40 percent of the respondents. These percentages were even greater than those computed for many of the NSE graduates. Hence, it is reasonable to think that there is a fairly strong latent demand for Social Sciences graduates. However, the shortages were perceived by much less respondents with respect to Humanities fields. Only exception was Foreign Language graduates whom as many as 62 percent of the respondents listed as the field where graduates are in short supply. Demand for Humanities graduates among large scale corporations appears to remain limited even under the perceived shortage of the Social Sciences graduates.

Changes in Desirable Quality

The evaluation of the human resources managers upon the personal qualities of their fresh recruits from higher education institutions is presented in TABLE 9.

It is clear that both non-technical and technical recruits were given high ratings with respect to "diligence" or "congeniality to the peer." On the other hand, both non-technical and technical recruits were considered to be wanting in "challenging spirit," "spontaneity" or "creativity." The general pattern appears to be consistent with the shift of demands away from clerical or production jobs to managerial or developmental jobs. Arguably, it reflects the growing emphasis among business firms to strengthen the ability to survive and develop in a period of diversifying corporate activities and unpredictable changes.

Meanwhile, there were sharp differences between the evaluation of non-technical and technical recruits. Most striking is the contrast with respect to "knowledge in speciality." As many as 83 percent of the human resources managers considered non-technical recruits as unsatisfactory in that respect, while only 17 percent considered they were satisfactory. On the other hand, the rating of technical graduates was neutral. It is not necessarily clear what the respondents implied by "special knowledge" that the non-technical recruits lacked. It is quite probable that, even though the respondents felt increasing needs of specialized knowledge for managerial works, they did not have even specific definition of the needs. Nonetheless, these evaluation results strongly indicate that the employers are not necessarily satisfied by the conventional contents in the HSS courses.

TABLE 9

Evaluation about Recent Graduates by Academic/Personality Traits, 1990

Academic/ Personality Item	No. of Responding Firms	% Distribution		
		Total	Satis-factory	Not Satis-factory
Non-Technical Recruits				
Congeniality	407	100.0	88.7	11.3
Diligence	405	100.0	75.0	25.0
International Awareness	405	100.0	66.1	33.9
Persuasiveness	407	100.0	44.8	55.2
Challenging Spirit	406	100.0	34.9	65.1
Spontaneity	406	100.0	34.4	65.6
Creativity	406	100.0	27.9	72.1
Knowledge in Speciality	406	100.0	17.1	82.9
Technical Recruits				
Diligence	378	100.0	83.3	16.7
Congeniality	378	100.0	80.1	19.9
International Awareness	377	100.0	53.0	47.0
Knowledge in Speciality	378	100.0	49.8	50.2
Challenging Spirit	377	100.0	32.7	67.3
Creativity	378	100.0	31.2	68.8
Persuasiveness	378	100.0	28.6	71.4
Spontaneity	377	100.0	25.8	74.2

Source: Keidanren[Japan Federation of Economic Organizations], 'Opinion Survey on Employment and Human Resources Strategies to Adopt to the New Changes in Economic and Industrial Structure.' 1989, p.12.

Note: Opinion poll on 421 large scale firms.

So far, the discussion had been made based upon the distinction between "technical" and "non-technical" jobs. But the line dividing the two has been made increasingly obscured by the advent of jobs related to information processing. TABLE 10 presents the distribution of fresh recruitment to twenty-one software firms with respect to the type and level of education. In 1986 the technical recruits from four-year universities and colleges accounted only for 24 percent of the total, while non-technical recruits accounted for a much greater share of 38 percent. Moreover, the share of non-technical college graduates has increased by almost 10 percentage

TABLE 10

Level of Schooling among Fresh Recruits to Software Industry

- Sample Survey, 1984 and 1986 -

Type of Firm	Year	Level of Schooling (%)					
		Total	4-Year Technical	4-Year Non-Tech.	2-Year/ Technical College	Special Training School	High School
All Types of Firms							
	1984	100	29.2	26.9	11.8	15.0	17.8
	1986	100	23.8	37.7	7.0	23.8	7.7
Affiliated with Computer Manufacturers							
300 employees or more							
	1984	100	29.2	26.9	11.8	15.0	17.8
	1986	100	26.8	33.5	7.8	20.1	7.7
Affiliated with Computer Users							
300 employees or more							
	1984	100	51.3	28.5	13.0	7.3	-
	1986	100	36.7	50.7	10.0	2.7	-
Less than 300 employees							
	1984	100	17.8	47.9	16.6	12.5	5.2
	1986	100	16.1	48.3	4.6	25.9	5.2
Independent							
300 employees or more							
	1984	100	22.8	21.6	3.2	45.2	4.4
	1986	100	11.3	36.4	4.1	46.0	2.2
Less than 300 employees							
	1984	100	14.6	17.0	16.7	20.5	31.3
	1986	100	19.6	30.4	24.4	25.3	28.5

Source: Recruit Monthly Survey Report (Jan. 1988), p.46.

Note: Original Survey by Shakai Keizai Kokumin Kaigi.
Sample consists of 21 software firms.

points in five years. However, the share of non-technical college graduates, as well as the graduates from Special Training Schools, tended to be greater with small scale firms. Also, the share of non-technical graduates was greater with the firms that dealt with the computer users rather than manufacturers. Obviously technical graduates are preferred to non-technical graduates, and the latter tend to be hired as a substitute for the former that has been increasingly in short supply. Also it is apparent that the

non-technical graduates are suitable only to a particular segment of the jobs related to software production. Nonetheless, these facts indicate the need to through fresh light to the relevancy of the courses of work in the HSS fields.

Response of Higher Education Institutions

The analyses of this chapter demonstrated that the demands for college graduates has been robust primarily because of structural shift of the economy. It reflects to an extent the shift of industrial structure away from manufacturing to various service sector. At the same time, the emphasis has been shifting within a company from formalized routine or clerical jobs to tasks that involve creativity and judgement. Employers, however, are not necessarily satisfied with the ability of the present graduates. Compared to the employers' expectation, particularly HSS graduates tend to lack special knowledge. The employers also wish the graduates to be more creative, spontaneous, and spirited. At the same time, the society is becoming increasingly critical about what higher education institutions, at rising costs, actually do to students.

How are higher education institutions poised to react to those changes? The issue is particularly pertinent to HSS departments. At least a segment of the institutions are trying to exploit the changes. Symbolic from this perspective is the fields of study where new institutions or new departments are established in recent years. In 1991, there were 70 newly established departments that started enrolling students. Among those, 12 departments carried titles that included the key-word of "information." Another 11 departments had something to do with international studies or foreign languages. Indeed, the departments with such classical titles as Law or Literature appear very few. These moves indicate at least that those new courses are considered to appeal to the society and attract future students. How they will succeed in satisfying the corporate needs is an issue that remains to be seen.

Some of the already established institutions or departments are also trying to respond to the perceived new needs to raise their popularity among future students. They develop curricula with special emphasis on training in language or information processing. There are also institutions that set up programs for the students to spend some time overseas. In many prestigious institutions, however, the willingness to cater to the change has been rather weak. To an extent this is because, for various reasons, many of the faculty members traditionally remain aloof from the practical value of their curriculum. It seems to be also the case that the current favorable employment status of their graduates bear little incentive to reassess the contents of education.

It is therefore unlikely for prestigious institutions to address the issue of employment relevancy by redirecting the content of under-graduate curricula to more needed knowledge or skills. Rather they appear to move to expand and develop their graduate courses, not only in the NSE field, to accommodate the need. But this issue should be analyzed in the context of the educational needs of college graduates, which is the subject of the following chapter.

Chapter 3

CONTINUING EDUCATION OF THE GRADUATES

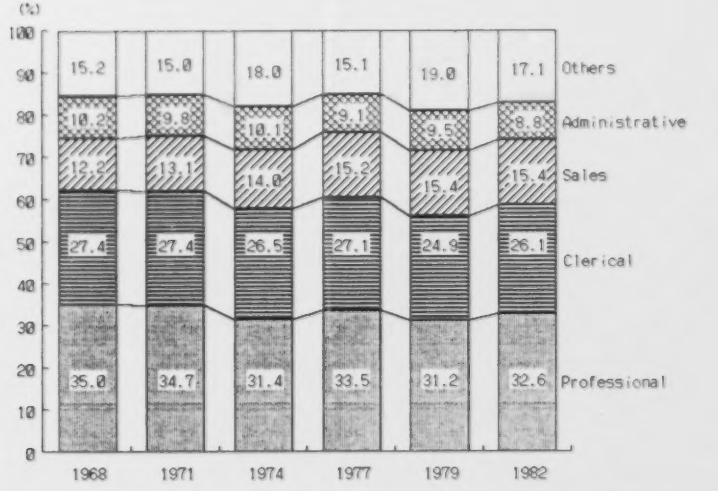
This chapter shifts the focus to higher education graduates who are already working in various organizations, and examines how they continue to acquire knowledge and skill. Section 1 below sets forward a conceptual framework. Prevalent practices of corporate training and education are described in Section 2. The factors forcing changes to conventional practices are examined in Section 3. Government policies in response to the new environment are described in Section 4.

1. CONCEPTUAL ISSUES

Scope of the Issue

As noted above, the present analysis focuses upon graduates from higher education who are working in various responsibilities in various organizations. In many societies, the word "professional" is used as almost an equivalent to working college graduates. This is not the case in Japan, and the conceptual difference between "professionals" on the one hand, and the workers with higher education on the other, deserves particular attention when studying the relation between education and employment in Japan. In fact, FIGURE 16 indicates that only one third of working university graduates are classified as "professionals" in the Labor Force Survey. Even including "managerial" workers, the proportion barely reaches the 50-percent level. The rest are classified as in "clerical," "sales" or other occupations. Moreover, the proportion of university graduates classified as professional or managerial workers have been even declining over time.

FIGURE 16
Occupational Distribution of H.E. Graduates - 1968-1982



Source: Labor Force Survey

The observation has implications that extend beyond terminology. Rather, it indicates that the work of a university graduate tends to be defined not in terms of individual job-contents, but rather in terms of the context in which the worker participate in the organizational function. How Japan is unique with this respect will be discussed below.

Since education and training for working college graduates is a relatively new issue, analytical concepts related to the subject have not been firmly established. Meanwhile, there is a substantial amount of scholarly literature focusing on the uniqueness of employment relation in Japan. It would be therefore useful to make a short discourse to review past studies and examine conceptual issues.

The "Japanese Model" of Employment and Training

Employment practice in Japan has been said to have particular characteristics, such as a permanent employment system and strong "loyalty" to company. Some authors even proceed to speak about the "Japanese model" of employment. Some of these popular concepts are derived from partial and superfluous observations and often inaccurate. It is particularly misleading to connect it to a cultural tradition of benevolent paternalism derived from traditional Confucian ideology or feudal history. Nonetheless, as a starting point of discussion, it will be useful to describe a "Japanese model." Major aspects of a typical "Japanese Model" may paraphrased as below:

(a) Career-long employment. Once a typical worker is employed by a firm, he will not change employer until retirement. Associated with this practice is the length-of-service and age-wage payment system. The wage level is primarily dependent upon the length of the service in the firm and age, not upon the type of job. The wage profile for a typical worker over his or her life-course draws a steep slope, signifying low wage rates at the entrance level and high rates towards retirement.

(b) Absence of functional labor markets for adult workers. Because of life-long employment, fierce competition takes place among prospective school graduates for better employment opportunities. Students at the final year of school go through matching process with prospective employers, and by the time of graduation, settled down with a particular employer. In this sense, there is a fully functioning job market at the entrance level to employment. Once employed, however, the prospect of mobility is severely limited, thus diminishing the scope and function of labor market at the advanced stages of career. At the same time, labor unions tend to be organized among the workers in a particular firm. Trade unions, organized along the line of particular profession and across firms, are non-existent.

(c) Importance of In-Firm Training. Because of the reluctance against employing workers with experience, business firms have to train their own workers for needed skills. At the same time, the firms face relatively little risk of losing trained workers to other firms. "...the so-called 'key workers' who receive successive training and retraining over the duration of much of their working careers within a given enterprise. These workers were not trained to their fullest capacities for any one type of work but were available within a company for ready transfer to work a variety of tasks as required by changing technology. This system provided the enterprise with a high degree of flexibility in utilizing the workers permanently in its employment." [Levine and Kawada 1980, p.114] Therefore, there is positive incentive for in-firm training.

There have been attempts made by scholars to set up, by integrating these elements, a logically coherent "Japanese model" of labor relations. Probably most influential among them is the one set forward by Dore [1987, p.28]. He characterized it as "Organization-Oriented," as contrasted to "Market-Oriented," system of employment. Then Dore argues that, while the "Market-Oriented" model is efficient in allocation of resources, the "Organization-Oriented" system is superior in inducing efficiency in more subtle way but no less important in the process of production and deliverance of services. Many scholars, both Japanese and non-Japanese, appear to concur with Dore that the elements listed above induced substantial investment by employers on education and training of employees, thus raising efficiency of working organizations.

It should be noted, however, that the Japanese model has been a subject of serious academic criticism from various aspects. Criticisms may be summarized in three points as below:

(a) Lifetime employment is not traditionally Japanese. Popular impression among foreign observers tends to attribute lifetime employment to traditional Japanese value derived from Confucian ideology or feudal social structure. But studies on historical development of labor relations in Japan concur that labor turn-over was high in the Meiji period. It was out of the needs of large scale plants to secure trained workers that the protected employment of "key workers" started. After World War I the Japanese economy experienced an economic boom and major Japanese firms faced shortage of skilled labor, and consequently a series of labor piracy and labor dispute. It was then that career-long employment started in those companies [Levine and Kawada 1980, p.115]. The system was then fortified partly as a means of confronting to rising labor unionism, and under growing state control towards the Second World War. In the postwar periods growth in employment of major corporations made it possible and necessary to maintain the practice.

(b) Lifetime employment applies to only a part of Japanese workforce. There is a substantial amount of empirical studies on this subject. After reviewing those studies, Levine concluded as follows: "For all the gaps in the evidence as to labor market mobility - elsewhere as well as in Japan - there is ample evidence to indicate that the concept of lifetime employment does not describe the career of a typical Japanese worker. Even the oft-heard claim that one-third or so of Japanese wage and salary workers "enjoy" lifetime employment is much in need of proof. ... Lifetime employment may well be the dream of many, even most, Japanese (and perhaps Americans). But to the extent that the notion describes actualities rather than ideals, it is valid only for a limited fraction of the labor force - some of those employed in the public sector, and some of those employed by large-scale private corporations." [Levine 1983, p.31]

(c) The "Japanese Model" may not even be uniquely Japanese. Koike [1981, pp.14-15] compared the labor statistics of Japan, the U.S. and a few EC countries and concluded that there is a substantial proportion of workers in the U.S. and in European countries that stay with the same employer for their entire working life. Particularly, the tenure of white collar workers in large scale corporations showed small, if any, differences in each countries. He argued that the observed high rates of mobility found outside Japan was accounted for by a small, particularly mobile fraction in the labor force. Meanwhile, the relatively low mobility among blue-collar workers in Japan helped to depress over-all rate of mobility in Japan. Koike [ibid., pp.48-85] also demonstrated that the steep wage profile can be found also among white collar workers in the U.S. and European countries. With respect to white-collar workers, Japan was not unique.

It is beyond the scope of this report to analyze systematically the validity of the "Japanese Model." Suffice to note at this point that the popular concepts of the Japanese model of life-time employment and the underlying worker loyalty demands critical reevaluation. Moreover, it may be inaccurate as a description of the reality in Japan, and some of its aspects are not unique to Japan. What is thought as the Japanese model nevertheless represents one of the ideal types in a wide spectrum of potential patterns of labor relations. In this particular model, the combination of internal promotion and in-firm training plays a critical role in acquiring professional skills and knowledge.

Individual and Corporate Mode of Continuing Education

At this point it will be useful to set forth a simple conceptual framework about continuing education of university graduates. Conventional concepts frequently employed in this context are "On-the-Job Training" (OJT hereafter) and "Off-the-Job Training" (Off-JT). What they exactly imply, however, are not necessarily clear. In a more strict sense, the two concepts are used to imply the time and place of education or training; if the education or training takes place during the working hours and in the place of work, it is OJT; otherwise, it is Off-JT. But sometimes what is really meant by OJT or Off-JT is the nature of its content. The knowledge and skill attained through OJT, obtained through particular work that the worker is undertaking, tend to be particular to the working environment or the firm. It is in this sense a concept close to what is called the "Becker-specific" training. On the other hand, Off-JT programs tend to purport to provide knowledge and skills particular to certain function or jobs, that are useful in any business firms in so far they require the function. The knowledge and skills in this case are typically required for entering a "trade" or "profession" in a classical sense. Another distinction not explicitly made by the concept of either OJT or Off-JT concerns the cost. Normally, the cost of OJT is thought to be borne by the employer in the form of foregone productivity. On the other hand, who pays the cost of Off-JT is not clear.

In order to avoid confusion arising from the vagueness of conventional concepts, it will be useful to classify the forms of continuing education explicitly along three dimensions, i.e. time and site, content, and payer of the cost. The conceptual framework is presented in TABLE 11.

TABLE 11
Corporate vs. Individual Model of Education/Training

	Corporate	Individual
Time and Site	On-the-Job	Off-the-Job
Content	Firm-Specific	Field-Specific
Cost Paid by	Employer	Worker

The framework shows that worker education encompasses a wide spectrum of forms. At one extreme is training of specific skills and knowledge useful for the particular workplace or firm, conducted at the place of work. The cost of training, both in the form of foregone productivity and direct cost, will be borne by the firm. We may call this extreme case the Corporate Mode. At the other extreme, a worker may enroll in school, possibly considering potential new employment opportunity, on his own time and financial resources. This may be called the Individual Mode. Between those two extremes, there can be various forms. With this framework in mind, present practices and their problems will be examined below.

2. PRESENT FORMS OF CONTINUING EDUCATION

This section describes various forms of training and education undertaken in business firms and government agencies. The forms can be classified into three categories: (i) initial training programs; (ii) mid-career training; and (iii) "self-development" plans.

Recruitment and Initial Induction Training

Every year, most of the fresh recruits from higher education institutions are formally employed on April 1, when they attend the entrance ceremony of their employers. The following initial training program for the newly employed is the most common type of training conducted by almost all organizations employing college graduates. A recent survey of 407 large scale corporations showed that 98 percent of them have some form of initial program (TABLE 12), the proportion being much greater than any other type of in-firm training. Other surveys indicate that small and medium size corporations also conduct such training. Government agencies also hold extensive induction training programs. Also, initial training is considered to be the most significant training of employees. A survey on top executives showed that 52 percent of top executives regarded initial training "very important." [Tohyama 1983] The rating was higher than any other type of training including manager training (45 percent).

In most cases an initial training program consists of two phases. First is one-to-two weeks of Introductory Seminars. The second phase is the Induction Training that span from one month to sometimes six months. A typical case of such programs can be observed in TABLE 13, which presents the outline of the

TABLE 12

Existence of Training Programs - 407 Large Scale Corporations

(%)

	Total	Yes	No
Initial Induction	100.0	98.3	1.7
Technician Training	100.0	46.9	53.1
Engineer Training	100.0	50.1	49.9
Sales Training	100.0	62.4	37.6
Executive Training	100.0	87.2	12.8
Middle/ High Age Workers Development	100.0	31.9	68.1
Others	100.0	13.0	87.0

Source: Recruit Monthly Survey Report (Jan. 1988).

introductory seminar and induction training undertaken by a large-scale electronics manufacturer.

The introductory seminar, in a sense, starts at the entrance ceremony. In most cases the chief executive of the employer will give a short presentation to the year's fresh recruits. In the following introductory seminar, that would last from a few days to two weeks, the new recruits are divided into groups and given lectures. Typically, the subjects include an outline of the corporation, regulations and manners and etiquette. The emphasis is laid upon initiating the fresh recruits into new life as a responsible organization man. In the case of the electronics manufacturer, fresh recruits for clerical jobs, mainly female high school and junior college graduates, complete initial training at the end of this phase and then are given their assignment. Almost all employers give introductory seminars. The form and length of the seminar do not vary much from firm to firm.

The induction training starts after the seminar. It involves some class-room lectures and introductory OJT at various departments of the company. In the case of the electronics manufacturer, induction training takes four-months and divided into two sub-phases. In the first sub-phase, there are lectures on basic physics as it relates to the product and the new recruits are given experimental projects. The recruits are then sent to one of the firm's factories, where they experience work at the shop-floor for about four weeks. In the following four weeks the new recruits are sent to local offices and experience sales and customer-service jobs. All the college graduates, recruited for either non-technical or technical careers, are involved in the training up

TABLE 13

Example of Induction Training - Case of A Large Electronics Manufacturer

April 2	ADMISSION CEREMONY
April 2 - 9	INDUCTION SEMINAR Classroom Lectures
April 10 - September 6	INDUCTION TRAINING 1
(For Both Administrative and Technical Recruits)	
April 10 - 27	Basic Training
April 10 - 13	Lectures on Basic Electronics, Analog and Digital Circuits
16 - 17	Planning of Exercise Project
18 - 26	Exercise Project
27	Review
May 1 - July 7	Plant and Sales Practicum
May 1 - 31	Plant Practice
June 1 - 28	Sales Practice
June 29 - July 6	Customer Service Practice
July 9	Administrative recruits are given assignment.
July 9 - September 7	INDUCTION TRAINING 2
(Technical Recruits only)	
	Classroom Lectures on Basic Technologies, Computer Science, Outline of Major Products
September 7	Technical recruits are given assignment.

Source: Kyoiku-Kunren Jitsureishu (Examples of Training and Education) 1989, p.239.

to this point. Non-technical recruits complete their training at this point and they are assigned to a job. Technical recruits, on the other hand, enter the second phase of induction training which would take another two months. By the beginning of September, the induction training is completed and the technical recruits are given assignments.

While the form and the length of introductory seminars do not vary much from firm to firm, the variation of induction training by individual firm is substantial. Some companies lay emphasis on classroom learning, while others concentrate almost exclusively on experiencing various jobs in the company. Its length also varies substantially. In general, induction training programs in corporations without produc-

tion sections, such as trading companies or banks, tend to be shorter than those in corporations with such sections. It has to be also noted that, while introductory seminars focus mainly upon abstract and mental aspects of the work, induction training tends to be aimed at providing specific knowledge and experiences related to the work.

The basic characteristics of the initial training programs as a whole is their emphasis upon company-specific experiences and knowledge. To a survey asking the purposes of initial training programs (plural choice allowed), 70 percent of the sampled firms indicated "knowledge and skill related to the work." Other items frequently indicated were "motivation to work" (44 percent), "understanding of the work organization" (41 percent), and "ability of personal communication" (34 percent). On the other hand, "specialized knowledge" were indicated by only 28 percent of the sample [Tohyama 1983, p.54].

Mid-Career Training

Mid-career training is in many ways a continuation of the initial training. It comprises three elements; On-the-Job Training (OJT), strategic job rotation, and training programs set before or at the time of promotion.

In many countries, OJT has long been the basis of in-firm training, either for production or white-collar workers. Dore [1989, p.90] argues, however, that the Japanese model of employment practices renders a particularly favorable environment for OJT to be effective. The lifelong employment practice induces active "participation" in improvement of productivity, thus motivating senior employees to teach and juniors to learn. It also has a realistic aspect. Since provision of OJT is regarded as one of the tasks of the work place, participation in OJT constitutes a factor in assessing the performance of both juniors and seniors. It should be also noted that OJT are sometimes organized into informal study groups. A popular example is the Quality Circle (QC), which is usually organized by production workers. Similar groups are also organized among graduate engineers.

But the effectiveness of OJT can not be fully realized without the practice of job rotation. Koike [1984] argued that Japanese production workers present a pattern of career that is "deeper" and "broader" than their counterparts in the United States or European countries. It is deeper because of age-based promotion practice, and broader because workers are exposed to a variety of jobs in the firm with the steps of promotion. The experience in various jobs helps workers to understand the working

of the firm as a whole. Koike also argued that the wider experiences of the workers have proved particularly effective when new technologies were introduced, or when the firm had to go through frequent reorganization.

Typically, a college graduate from the social sciences or humanities departments are hired by business firms without clear job specifications. He or she would then be intentionally exposed to various functions of the firm which do not necessarily have direct relations to their training. The underlying idea for such a practice is to create a worker with adequate understanding of how the firm works. As his or her career advances he would be promoted to some form of managerial status. The managerial position is considered more as a position in the power hierarchy than as a specialized job. Exposure to various aspects of the corporate function helps the worker to be a more effective manager.

However, the extent of job rotation differs greatly by the size of corporation. TABLE 14 reports the results of a Ministry of Labor survey on corporate policies about job rotation. Evidently, corporations are more likely to rotate college graduates, and more positive about its value as training, than high school graduates. It is also apparent that administrative recruits are more likely to be the subject of positive rotation. But corporate size is critical factor, as larger corporations have a more active and positive rotation policy. As much as 67 percent of very large corporations with five thousand employees or more answered that they actively rotate university graduates on their administrative career track and considered it a means of developing employee abilities. In contrast, for small firms with 100 employees or less, the corresponding proportion was only 10 percent, while 31 percent answered that they avoid rotation except to fill a vacancy. This sharp contrast by size can also be found with college graduates on the technical tracks.

The third element of in-career training is the training programs required at particular stages in career, or as a prerequisite for promotion to certain positions, such as Unit Chief or Section Chief. It is not uncommon that the workers are given rank in job-qualification scale, which is set apart from the position in organizational hierarchy, and training is required to obtain the rank. In some cases training is required as a prerequisite for promotion to obtain the rank. Most of these seminars are held at classrooms and span from few days to few weeks. The content tends to give much weight on managerial and communication skills.

TABLE 14

Corporate Policies Regarding Job Rotation

(%)

Firm Size (Number of Employees)	Total	Rotate as a means for ability development	Rotate when necessary	Avoid Rotation except for filling vacancies	No Response
UNIVERSITY GRADUATES					
Administrative					
5,000 or more	100.0	66.8	32.8	0.4	-
1,000 - 4,999	100.0	48.9	48.0	2.4	0.7
300 - 999	100.0	28.4	60.2	9.2	2.2
100 - 299	100.0	16.5	59.1	18.4	6.0
30 - 99	100.0	10.4	48.4	30.6	10.6
All Sizes	100.0	14.7	52.1	24.8	8.4
Technical					
5,000 or more	100.0	57.8	39.2	2.5	0.5
1,000 - 4,999	100.0	40.2	53.7	4.2	1.9
300 - 999	100.0	24.1	64.8	7.8	3.3
100 - 299	100.0	15.7	61.2	14.5	8.6
30 - 99	100.0	11.4	46.7	27.8	14.1
All Sizes	100.0	14.4	52.1	22.0	11.5
HIGH SCHOOL GRADUATES					
Clerical					
5,000 or more	100.0	54.3	42.5	3.2	-
1,000 - 4,999	100.0	39.0	55.8	4.3	0.9
300 - 999	100.0	22.3	63.7	11.6	2.4
100 - 299	100.0	14.9	59.1	21.5	4.5
30 - 99	100.0	8.0	48.1	34.3	9.6
All Sizes	100.0	11.3	51.9	29.1	7.7
Production					
5,000 or more	100.0	31.7	60.1	7.1	1.1
1,000 - 4,999	100.0	22.4	66.3	9.1	2.2
300 - 999	100.0	16.5	68.8	11.1	3.6
100 - 299	100.0	12.8	64.3	16.5	6.4
30 - 99	100.0	8.4	52.6	29.6	9.4
All Sizes	100.0	10.2	56.7	24.9	8.2

Source: Ministry of Labor, Koyo Kanri Chosa[Survey on Employment Management], 1981.

TABLE 15
Existing Methods for Off-JT

Method	Frequency (%)
Out-House Commercial Seminars	55.9
In-House Training Courses	52.0
Training Courses Given by Other Firms	28.2
Correspondence Courses	21.3
Public Occupational Training Institutions	8.5
Special Training Schools	6.2
Undergraduate/Graduate Courses (Japan)	2.9
Undergraduate/Graduate Courses (Overseas)	1.1
Others	5.8

Source: Ministry of Labor, 'Report of the Survey on Corporative Education and Training,' 1986.
Note: Sample survey of 2,363 business firms with 30 employees or more.

Speciality Training and Self-Development Programs

The third category of training comprises those geared to provide specialized knowledge or skill. To the extent that certain knowledge or skill constitutes absolute prerequisite to accomplish a job, its training is likely to be integrated into either one of the two types of training described above. That leaves, however, a wide range of knowledge and skill useful for work and yet not given through OJT. In some cases, the employer may consider the training as a part of job and pay for the costs. But this type of training is sometimes given less formal recognition than the previous two. Instead, the employers tend to emphasize voluntary participation. Participants may have to pay at least a fraction of the cost, and frequently have to devote their leisure time. To emphasize the voluntary nature of training, many firms use the term "Self-Development." This category of training often takes place away from the working place, but not necessarily coincide with the concept of Off-JT. Nevertheless, survey results about the used means of Off-JT presented in TABLE 15 would provide a rough idea about the forms of training in this category. The data demonstrate that more than half of the surveyed companies employed outside consultants to organize seminars or training courses, or sometimes organized seminars by themselves. In addition, 28 percent use in-house training given by other companies, which are the manufacturers of particular equipment or in close connection. It also deserves attention that correspondence courses are used by 21 percent of firms. The role of formal schools is still limited, with the Special Training Schools being used by 6 percent of the firms, and universities and colleges even less.

Specialized Seminars held on ad-hoc basis take various forms and cover various subjects. For non-technical workers, seminars may be held to instruct a particular managerial or sales techniques. Knowledge related to business law, tax or accounting are other popular subjects. For technical workers, seminars may given on new products or production techniques. The duration and the degree of formal recognition by the firm of this type of training vary substantially. In some large manufacturing companies, this type of training is extended within the firm to cover advanced knowledge and organized systematically. For example, a leading steel manufacturer holds "Applied Technologies Course" for graduate engineers. The course comprises 28 short-period seminars, and each seminar takes three to fourteen days enrolling ten to sixty people at one time. The subjects of the seminars include: "Economics of Technology," "History of Engineering - The Case of Foundry," "Measurement and Control," "Dynamics of Manufacturing Process," and "Application of Numeric Control." The seminars are taught by specialists from inside as well as outside the company. [Nihon Nohritsu Kyokai 1990, p.410]

In some cases, the content of in-house training include advanced subjects related to state-of-the-art technology. A manufacturer of electronic and communication devices holds a "Saturday Technology College." [Gohda P.106] Lectures were given every other Saturday for six months. There are four courses: "Digital Technology," "Analogue Circuit," "Communication Technology" and "Material, Solid State and Analysis." Application exceeded the class capacity of thirty to fifty persons by two or three times. Another example is "Engineering Workshop" at a manufacturer of heavy electronic devices [ibid p.90]. Every year about twenty students are selected among graduate engineers at around age 30. Lectures are given by about one-hundred leading experts in the company. Intensive seminars, each lasting six days, are held once a month for twelve months. This workshop is regarded as the strategic means to create future competitive edge in technology.

Correspondence Courses are popular means of acquiring specific knowledge or skills. A list of such correspondence courses published by the Ministry of Labor included more than thousand courses. Many of these courses are subjects of partial government subsidies. These courses are provided by private enterprises specializing in corresponding courses and non-profit organizations. Most of these courses do not require a prescribed level of formal education, and admit high school graduates. But a considerable number of them are in fact popular among working college graduates.

Some of these corresponding courses lead to a variety of qualification accredited by the Ministry of Labor, other ministries or industrial organizations. Contrasting the Japanese and the British systems of job qualification, Dore [1989, pp.132-133] pointed out: "There are two possible approaches to the business of certifying vocational competence. One is to treat skills as discrete and miscellaneous, infinitely varied in their requirements for mastery and varied, also, in the ways in which they may be combined together in actual occupational roles. The unit breakdown of skills for testing purposes may therefore be allowed to follow the logic of the particular tasks to which they relate....The alternative is the whole-role certification approach, which assumes that the way skills are combined in practice is limited, and the important thing is to certify whether or not a person has acquired one of these 'standard packages' required for standard occupational roles." According to Dore, the former 'module' approach characterizes the Japanese, and the latter 'standard packages' approach characterizes the British system. A significant implication of the difference between the two approaches lies in the relation of these qualifications with formal education and job. Under the latter system a particular certification is associated with particular levels of school education and a particular job. But with the former, the association can be more flexible. Therefore, it is not only high school graduates that take examination for a certain certificate. College graduate frequently take it, even though it does not imply a professional status.

Part time studies at schools are another means of continuing education. Increasingly popular are Special Training Schools, which normally admit new high school graduates, but also offer extension courses on the subjects related to their regular courses. TABLE 16 summarizes the distribution of the extension courses by subject field and by form of instruction. There are a substantial number of courses in business and engineering. A large proportion of the courses in culture and liberal arts are also considered to be related to work, for they include a large number of foreign language courses. As many as half of the students in both Engineering and Business courses were currently employed (TABLE 17). Information about the distribution by the level of educational background is not available. It deserves attention, however, that among the students in the Business courses there were a substantial number of students already enrolled in junior colleges or universities. Most of these students hope to obtain qualifications in accounting or other practical skills, which would place them in better position in the job market. It can be interpreted as an indication that those courses will be also useful for the college graduates already employed.

TABLE 16

Number of Extension Courses Provided by STS

	Total N. of Courses(1)	Distribution by Form						
		Day	Night	Day and Night	Only Saturday	Holidays	Correspondence	Others
Engineering	377	98	249	13	5	1	14	-
Agriculture	2	2	-	-	-	-	-	-
Health-Related	50	40	6	1	1	-	2	-
Public Health	179	70	25	12	7	-	91	-
Education/ Social Services	20	13	5	-	2	-	-	-
Business	670	140	437	53	18	32	4	5
Home Science	934	474	351	107	46	9	1	2
Culture/ Liberal Arts	1,351	383	836	96	54	20	2	4

Source: MESC, Report of the Survey on Special Training Schools, 1990.
Note: Due to multiple entry, the total does not add up to (1).

TABLE 17

Extension Courses of STS - Number of Students by Employment/Schooling Status

	Total N. of Students	of which								
		Employed			Enrolled in Other School					Others
		Total	Paid by Employer	Others	Total	Senior HS	2-Year Col.	4-Year Col.	Others	
Engineering	10,698	4,575	1,533	3,042	1,842	1,093	297	373	79	4,281
Agriculture	474	206	-	206	268	262	4	2	-	-
Health-Related	2,091	698	231	467	33	12	5	-	16	1,360
Public Health	13,728	10,107	3,722	6,385	727	426	180	83	38	2,894
Education/ Social Services	1,680	1,109	33	1,076	280	-	267	13	-	291
Business	27,666	12,860	964	11,896	5,637	340	889	3,452	956	9,169
Home Science	13,375	3,982	344	3,638	513	86	155	120	152	8,880
Culture/ Liberal Arts	63,141	9,844	904	8,940	31,232	24,540	457	1,733	4,502	22,065

Source: Same as Table 16.

On the whole, however, the role of higher education institutions has been limited. TABLE 15 above indicated that only less than 3 percent of the firms surveyed had sent their employees to under-graduate or graduate courses of higher education institutions.

The description above demonstrated that the predominant forms of continuing education and training practiced in Japanese organizations are close to the Corporate Mode, even though some elements of the Individual Mode has been added. Obviously, in many ways those forms have been efficient and effective. Such a situation, however, may be changing now, as discussed in the following sections.

3. CHALLENGES TO THE CORPORATE MODE

Validity of the present practices of continuing education, in many ways approximated to the Corporate Mode, are now challenged by changes in various internal and external factors to the firm. This section examines such factors and discusses the needs and possibility of alternative forms.

Emergence of Mid-Career Job Market

It has been said that life-time employment has been the basis of the training system by providing incentive for the workers to stay in the firm and receive necessary training. There are indications, however, that worker mobility is rising even among college graduates.

An obvious factor is the rapid shift in economic structure that makes it inevitable to move the workforce from sectors of declining demands to other sectors. It is true that Japanese large-scale companies survived Oil-Crisis in the mid-1970s and the following restructuring of the economy by shifting workforce from a department to others, thus succeeding in not discharging many workers as anticipated. The experience is said to be an indication that the lifetime employment system in Japan, despite its ostensible rigidity, can in fact induce flexibility. Statistics in fact indicate that the average lengths of service in a single company at middle age brackets have slightly risen in past ten years. Nonetheless, as the pace of restructuring accelerates, it is possible that even in large-scale companies such shock-absorbing function will become insufficient.

Meanwhile, because of "restructuring" of corporate activities, many firms face shortage of skilled workforce in strategic fields. Engineers specializing in research and development in computer software, solid-state or any fields of advanced technology are good examples. According to a survey on large scale corporations about planned measures for securing workforce in new areas of activity revealed that especially with technical R & D staff, 33 percent were planning to recruit trained workers from other firms, 52 percent were planning to recruit fresh graduates. Those expecting in-house training was only 13 percent. Even in such traditional fields as banking, specialists in international money market are subjects of "head-hunting." Mobility of this sort has diminished the stigma associated with moving from a company to another.

Indeed, among young college graduates mobility has been steadily on the rise in recent years. A questionnaire survey on working college graduates revealed that 15 percent of the college graduates after second year of graduation have already experienced a change in employer [Rikuruto 1991, p.3]. Meanwhile, 25 percent of employers responded that the number of college graduates quitting the job within three years has been increasing, compared to 15 percent that answered decreasing. Now corporate human resources sections and recruitment service companies are talking about the "second fresh graduates market" geared to those seeking entry to the second employment opportunity after graduation. Obviously, the regimental procession along school-employment-career path has been threatened at the entrance level.

Diversifying Career of Higher Education Graduates

In the traditional career pattern, a typical university graduate was hired not as a professional manager or an independent engineer. He would experience various jobs in the company and accumulate experiences of company-specific knowledge. Then at certain age, he would be promoted to middle level management and later to even higher position. The specialized knowledge acquired in the university therefore did not have to be directly relevant to the work. Even in the course of career, being too much absorbed into a particular type of knowledge can sometimes become a negative factor for promotion, for it was considered to hinder general perspectives necessary for a manager. This tends to be the case more with non-technical graduates, but to a lesser extent with the cases of graduates from engineering or related fields. For rendering managers in this mold, the pattern of in-firm training based mainly on the combination between OJT and job-rotation was not only enough but also most efficient.

But such a mechanism was possible only because there were significantly fewer college graduates relative to the workers to be supervised. It was certainly the case when higher education was still at its "elite stage," enrolling less than 10 percent of the population of the same age. Even after higher education became rapidly popular, the traditional role did not change at least for a while. Because enrollment rate in four-year college reached the 30 percent level by early 1970s, and the baby-boom generation reached the college-going age, large numbers of college graduates entered the labor market every year. In the work places, it only implied expansion of young white-collar workers to be supervised. Demand for supervisors therefore increased. But, the long-run effects of mass higher education has finally been appearing. Now the first cohort of large college graduates have reached their forties. The prospect of this, and the following, generation to follow the traditional ladder of promotion and obtain traditional supervising position is becoming remote. Instead, many of them will have to work as a specialist in some field.

The Changes in Demanded Knowledge

Another obvious factor forcing change is the rising level of technology and acceleration of technological development.

There is growing perception among engineers about mismatch between what was taught in college and what is required on the job. TABLE 18 summarizes the results from surveys on graduate engineers about their evaluation of what they learned in college and of the knowledge and skills actually required in performing the present job [Mirai Kogaku Kenkyusho 1986]. The surveys were undertaken in two time-periods. In 1976, slightly less than half of the graduate engineers (age 35 years or older) responded that there was a large or absolute gap between the two. In 1986, graduate engineers of the same age giving the similar answers rose to 60 percent. The proportion was even higher at 68 percent among younger respondents. Obviously, the conceived gap has been growing rapidly in recent years.

The corporate need for graduates with more advanced knowledge and training is indicated by the increasing number of fresh recruits with Master's degrees in technical fields. Traditionally, graduate education even in engineering departments had been considered to be mainly for those advancing to academic careers. Manufacturing firms recruited new graduates from undergraduate engineering departments and trained them through in-firm training programs described above. Students with post-graduate degrees were recruited for limited research positions, and their wage were not significantly different from the college graduates at the same age. Since the

TABLE 18

Conceived Gap Between What was Learned and What is Needed

	No Gap	Slight Gap	Large Gap	Absolute Gap
1976 Survey				
35 years or older	16.2	35.6	39.4	8.1
1986 Survey				
35 years or older	10.6	29.0	46.2	14.2
34 years or less	8.1	23.8	46.0	22.0

Source: Mirai Kogaku Kenkyusho 1986.

end of 1970s, however, manufacturing firms became increasingly eager to recruit graduate students with Master's degree in engineering or related fields. Reflecting the increasing value attached to Master's degree, graduate courses became popular among undergraduates. Indeed, graduates with Master's degree in engineering who did not advance to the doctorate and went into employment was only 6,294 in 1980. By 1990, it has increased to 11,403. Similar increases have been observed in other technical fields: Natural sciences from 809 to 1,829; and agriculture from 730 to 1,238. Over the same period, fresh recruits with bachelors degrees in these areas even declined slightly.

Demands for advanced or specialized knowledge are also increasing in non-technical fields. One significant factor behind it is the extension of corporate activities to international scenes. Accounting and auditing practices, patent law, and corporate laws in various countries of the world are a few examples of the subject with which demand is growing. Firms have been responding to these needs by hiring local professional lawyers, accountants or consultants. It is evident, however, that the firms also need their own staff to understand the issue before delegating to local professionals.

Many corporations try to widen the scope of their in-firm training to encompass advanced and specialized knowledge. In fact, the specialized training programs in some of the leading manufacturers may well be superior to academic institutions. But obviously, small scale firms are not equipped with such research and development ability. Moreover, even for large scale firms, in-firm training would not be sufficient

TABLE 19

Desirable Qualities to be Obtained through Worker Education

- Sample Survey of 421 Large Scale Corporations -

Desirable Qualities	Past 5 Years	Coming 5 Years
	Response (%)	Response (%)
Innovative Idea & Imagination; Sensitivity	74 (18.8)	219 (58.2)
International Perspectives	97 (24.6)	190 (50.5)
Leadership	241 (61.2)	172 (45.7)
Experiences & Knowledges in Management	226 (57.4)	166 (44.1)
Ability for Planning & Coordination	86 (21.8)	154 (41.0)
Specialized Knowledges & Experiences	224 (56.9)	152 (40.4)
Efficiency in Stylized Work	95 (24.1)	14 (3.7)
Others	2 (0.5)	3 (0.8)
N. of Responding Firms	394 (-)	376 (-)

Source: Keidanren [Japan Federation of Economic Organizations], 'Opinion Survey on Employment and Human Resources Strategies to Adopt to the New Changes in Economic and Industrial Structure.' 1989, p.14.

Note: Due to allowed plural choice, the percentages do not add up to 100.

to the extent that needed knowledge or information belongs to outside the fields of the firms' traditional activity. And many firms are trying to venture in new fields.

Equally important, many business firms now demand not only new specialized knowledge, but also a fresh way of thinking and perspectives. It derived from the shift of corporate strategies from the one of expanding the existing activities to the one of perpetually innovating and diversifying activities. Particularly since the mid-1980s, it is said that emphasis has been given not to improving efficiency of a given production process but to innovating the process itself. Indeed, a sample survey revealed that business firms regard "innovative ideas and imagination" and "international perspective" as becoming the most important factors to be obtained through in-firm training in the coming years (TABLE 19).

Needs for the Individual Mode of Training

The factors described above are likely to affect both the needs and underlying conditions for continuing graduate education in Japan. It has to be emphasized that to the extent that lifetime employment remains as the basic mode of employment, the Corporate Mode of training consisting mainly of OJT in combination with job rotation will stay as the core of continuing graduate education. It is still considered to be effective and efficient in many aspects. But, it may not be sufficient in responding to the challenges described above.

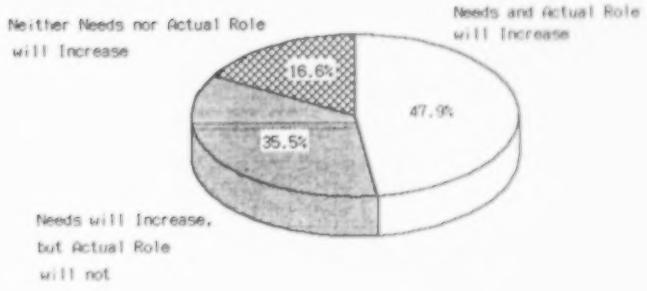
The content of knowledge and skills required to perform specialized tasks in various fields are becoming advanced. They tend to be less firm-specific and more specific to a specialized field of knowledge. Moreover, there will be an increasingly wide variety of demanded specialized knowledge, and consequently the type of training. Unlike firm-specific knowledge and skills accumulated in the workplace, this type of knowledge will not be effectively obtained in the workplace, or would entail prohibitive costs. Utilizing resources outside the workplace, or outside the company, becomes essential. The needs of specialized knowledge will also erode the effectiveness of the training that starts with induction training and evolves to the combination between training with job rotation. The needed pattern of training will have to be less uniform and more individualized. Consequently it will become difficult for the firm or the workplace to force training; individual workers must be interested and motivated for the training. At the same time, to the extent that the training becomes less firm-specific and the prospect of labor mobility increases, the firm will become less willing to invest on the training. Individual workers will have to contribute to the training, expecting to reap the greater proportion of the benefit from it. All these factors appear to point to the direction of Individual, rather than Corporate, Mode of continuing education.

In fact, recent changes in in-firm training - particularly the popular use of correspondence courses and outside seminars under "Self-Development" schemes discussed - indicate that the new elements have already become a significant part of existing programs.

It has to be pointed out, however, that further development towards Individual Mode should encounter a number of considerable obstacles. A questionnaire survey by Japan Federation of Economic Organizations on major corporations asked the needs and problems of Off-JT, and the results are presented in FIGURE 17. As much as 83 percent of the surveyed corporations responded that the needs for Off-JT would increase, with the remaining 17 percent not admitting the needs. But of the 83

FIGURE 17

Predicted Needs for and Actual Role of Off-JT in Future



percent, 36 percent predicted at the same time that the actual role of Off-JT would not increase. In all, slightly more than half of the respondents thought it unlikely that, however the potential needs, the Off-JT will gain significance. Corporate managers are not necessarily optimistic about the shift toward Individual Mode.

An obvious, and probably the most serious, problem for the Individual Mode of training will be its costs. The costs consist of not only the direct costs, but also the indirect costs in the form of foregone working hours. Even though the direct costs of some type of training can be considerable, it is the indirect costs that may reach a prohibitive level. According to the Ministry of Labor survey on business firms, as much as 74 percent of the respondents listed the time of trainee as a limiting factor of Off-JT (TABLE 20). Direct costs ranked as a distant second, quoted by only 30 percent (plural response permitted). It is also remarkable from this table that lack of facilities, teaching staff or institutions are quoted by only small proportions of respondents. How to reduce the cost of Off-JT in the form of foregone working time, and who should bear the burden, would remain as a critical issue for the future of continuing graduate education.

Expectation on Higher Education Institutions

It is uncertain at this point how fast, and to what extent, demand for continuing education in Individual Mode will expand. It is also not clear what educational institutions would respond to such demands. As stated above, the role of higher

TABLE 20
Limiting Factors of Off-JT

Quoted Limiting Factors for Off-JT	(%)
Time of Trainee	74.1
Costs	29.6
Organization for Training	16.2
Teaching Staff (In-House)	16.1
Facility (In-House)	11.0
Technical Expertise in Training	9.3
Lack of Training Institutions	8.2
Possibility of Resignation after Training	6.9
Lack of Support from Top-Management	4.1

Source: Ministry of Labor, 'Report of the Survey on Corporative Education and Training,' 1986.
Note: Sample survey of 2,363 business firms with 30 employees or more.

education institutions in continuing education has been, so far, limited. But there appears to be a growing awareness from business firms of the opportunity to utilize the existing capacities in higher education institutions.

Recently an opinion survey asked personnel managers in four-hundred and twenty-one large size business corporations their assessment of Off-JT. TABLE 21 summarizes the answer as to what the corporations thought important as a condition for promoting Off-JT. Plural answers were allowed, and the figures in the table indicate the frequency that each item was quoted. While 61 percent of the respondents quoted "tax or financial incentives to workers," a considerable number of firms also agreed on the need of more active enrollment of higher education institutions. "Active industry-university exchanges" and "increased acceptance of the workers to undergraduate and graduate courses of universities" were selected by 42 and 35 percent respectively.

The same survey also asked whether the business firm had already, or intended to have, an active relation in various forms with higher education institutions, and if they had, whether they want to expand or reduce the present level (FIGURE 18). To the question about the training of their employees contracted to higher education institutions, 143 firms, or one-third of the surveyed firms answered that they wish to start or expand the present level. Including those who have already started such

TABLE 21

Desirable Means for Promoting Off-JT

- Sample Survey of 421 Large Scale Corporations -

Desirable Means	Frequency (%)	
Tax/Financial Incentives to Workers	233	(60.7)
Active Industry-University Exchanges	163	(42.4)
Extended Acceptance to Universities/Graduate Programs	135	(35.2)
Establishment of Public Industrial Training/Research Centers	106	(27.6)
Promotion of Private Industrial Training Firms	36	(9.4)
Upgrade of Training Contents in Public Skill Training Centers	34	(8.9)
Shortened Work-Hours	30	(7.8)
Others	1	(0.3)
N. of Responding Firms	384	(-)

Source: Keidanren [Japan Federation of Economic Organizations], 'Opinion Survey on Employment and Human Resources Strategies to Adopt to the New Changes in Economic and Industrial Structure.' 1987, p.17.

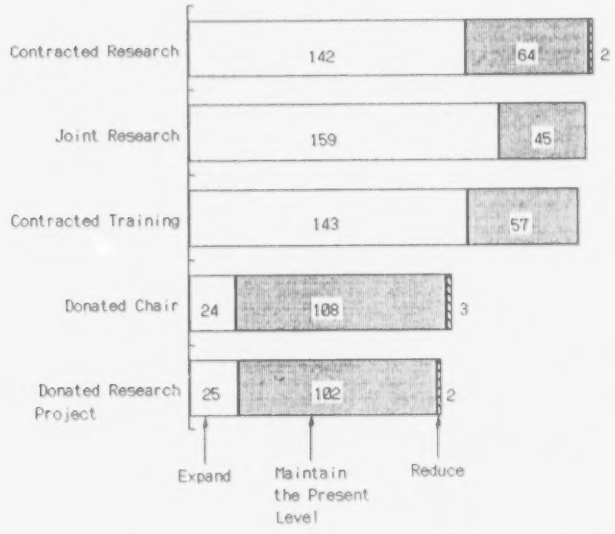
Note: Due to allowed plural choice, the percentages do not add up to 100.

program and wish to maintain the present level, the corporations that have some experience or plan to engage in such a form of cooperation with higher education institutions amount to about a half of the surveyed corporations. Moreover, about one-third of the surveyed corporations answered that they wished to expand the number or size of research projects contracted to higher education institutions. Including those who wish to maintain the present level, about half were favorable to contracted research. Almost the same can be said about the attitude of the corporations as to the joint research projects with universities. It should be noted that, a contracted research or joint research project typically contains training for the employees of the involved firm as an integral element. In contrast, donated chairs or donated research projects are relatively unpopular. As a whole the survey results demonstrated that business corporations have high expectation on the types of cooperation with universities that would benefit themselves, and training of the employees is its very significant element.

FIGURE 18

Planned Cooperation with Higher Education Institutions

- Sample Survey of 421 Large Scale Corporations -



4. RESPONSE OF HIGHER EDUCATION

While the previous sections described what happened outside higher education, the present section outlines the response of higher education policies and higher education institutions.

Government Policies

In recent years the government has been increasingly aware of the needs of continuing education for working adults. In the Special Education Council, which set up by the Cabinet in 1984 for a thorough reevaluation of the educational system in Japan, one of the major issues was life-long education. Specifically regarding training for white-collar workers, the Council's Second Report, released in 1986, stated as follows:

So far, the business enterprises in Japan have sought to form skill among the workers through exposing them to various tasks in the working place, or by On-the-Job-Training.

However, the exclusive dependence upon OJT has become increasingly inadequate to develop abilities to adopt to the changes caused by such structural changes as the advances in micro-electronics and other technologies, introduction of information technologies and accompanying qualitative shifts in job contents, aging of the work force, and the increasing female workers. That will necessitate formation of greater intellectual skills through occasional Off-the-Job-Training taking place at various stages of one's working life. Especially lacking at present is the training opportunities for the white-collar workers in professional, technical or clerical jobs, and those for female workers. Efforts should be paid to develop life-long occupational training for workers. (Part 2, Chapter 5)

From such perspective, it proposed among others to "redevelop under-graduate and graduate courses in higher education institutions as the place for adults to develop their skill." (idem.)

Right after the Special Council on Education issued its final report and dissolved in 1987, the government established a University Council under the Ministry of Education, Science and Culture. The Council set up several subcommittees, including Graduate Education Subcommittee, which subsequently was assigned to reevaluate graduate education. In 1988 it released its first report titled "Toward A Flexible Graduate Education System." The report recognized increasing needs of various types of graduate studies, not only for training of academic manpower but also as a place for retraining of working adults, and proposed to respond to this challenge by inducing greater flexibility and variety in graduate education. Specifically the report suggested a few changes in chartering standards, some of which had direct relevance to retraining working college graduates.

Following the report, MESC revised in 1989 the Chartering Standards for Graduate Education. Some of the changes were significant from the perspective of continuing education for working adults. First was the addition of a clause providing the basis for Master's courses that consist entirely of evening classes. A related change was made so that such courses may set standard length of study at longer than two years. A tentative change towards this direction had been made previously, allowing one year of the two year residency requirement to be satisfied by night-courses. In a sense, the revision of this time pursued this direction further. But it also implied a conceptual shift about graduate education, for it would acknowledge for the

first time a Master's degree completed on part-time basis. Second, a significant change was also made on admission requirements for Doctoral courses. Previously it was essential that the candidate should have a Master's degree, but the change made it possible to substitute it with demonstrated ability in research. This opened a way for those who accumulated experiences in the industry to obtain a doctorate in a shorter period. Third, the mandatory requirement of Master's thesis before obtaining the Master's degree was removed. This would open a possibility of establishing Master's courses primarily targeted at professional graduate education.

Subsequently, Graduate Education Subcommittee of the University Council released in 1991 a proceeding report, this time focusing upon the quantitative aspects of graduate education. It identified expanding potential demands for graduate education arising from (i) the rising levels of academic researches and that require increased academic manpower , (ii) the need for highly specialized personnels in industry and the needs for retraining of personnels, and (iii) the needs to expand educational opportunities for foreign students. The report then analyzed the trends in the demands for graduate education. With respect to retraining of college graduates, it stated as follows:

> At present, the number of working adults formally enrolled in graduate courses is not large relative to the total enrollment. But even that number is steadily on the rise, particularly after introduction of special admission requirement for working adults.
>
> Meanwhile, graduate courses have informal function in recurrent education through such activities as open seminars, admission of trainees from the industry, or supervision of doctoral dissertation submitted from researchers in the industry. It should be also noted that the graduate courses entirely or partly consisting of evening classes have gained popularity. The recent entrants include not only those sent by their employers, but also those who chose to attend by their own initiative wishing to "refresh" their professional ability. These facts indicate the existence of strong desire to learn among working adults.
>
> It is therefore envisaged that the demands for recurrent education catering to working adults should grow even further, if the learning forms and contents of graduate courses gain greater variety and flexibility while the relation between graduate education and in-firm training becomes closer. Based on the assessment, the council proposed to double the enrollment in graduate courses by the year 2000.

The same report also suggested that various concrete measures should be considered in future in order to substantiate graduate education for working adults. It indicated, for example, to create standard curricula for part-time graduate students that last more than the present norm of two-years. Another suggested change was relaxation of chartering standards that would facilitate establishment of branch classrooms built close to, or within, the industrial centers where many of the potential students work. Yet in another move, the MESC organized in 1990 a committee to study continuing education for graduate engineers. What these moves will produce in future remain to be seen.

Another direction of policy change is being sought in developing and systematizing the professional qualifications for college graduates. At present, Japan has numerous professional certificates or qualifications that are accredited or granted by central government agencies, professional associations and other non-profit bodies, or sometimes by private firms. Building upon this basis, a working committee under the Ministry of Labor recently proposed a "Unit-Master Degree System" of professional training [Report of the Committee for Appraising Future Professional Ability Development Systems, August 15, 1990]. This scheme purports to develop specialized abilities of white collar workers in such fields as accounting or finance. Under this system, potential candidates would take course works offered by existing universities or Special Training Schools. In future, graduate level institutions and televised networks may be established to supplement the existing courses. A proposed Manpower Development Organization would accredit course works with given standards. The accredited courses are then transferred to basic "Units." After accumulating a number of the basic "Units" the candidate will be awarded a qualification tentatively called "Master." The qualification, however, does not entail academic status as the conventional Master's degree conferred by higher education institutions. The same committee also proposed an information service based on a database of the opportunities for continuing professional education. These plans are still in the stage of formulation.

Changes in Higher Education Institutions

Partly due to the emerging social needs, and partly to the policy changes, individual universities and colleges have started to offer opportunities of continuing education for working adults in various forms. Such activities can be categorized into

three classes: (i) non-credit extension courses; (ii) informal training through contracted training and other forms of university-business cooperation programs; and (iii) admission to graduate courses.

Non-credit extension courses provided by higher education institutions have increased dramatically in recent years. The number of courses more than doubled from about one-thousand and two-hundred in 1978 to almost three-thousand in 1988. Seventy-five percent of the universities and colleges in Japan were providing some form of extension courses in 1988, enrolling some 369 thousand persons in total. Many of these courses, however, are geared to those seeking cultural enrichment in such fields as liberal arts, sports, foreign languages. The length of the courses tends to be short, the average being only 15 credit hours. Average size of class is as many as 130 persons. Most of them set the targetted audience as "general public."

Nonetheless, there were almost four-hundred courses on specialized and professional subjects. Some of these courses extend beyond 30 credit hours. Some universities offer quite intensive non-credit training courses in such fields as advanced or information technology targeting at graduate engineers. In the case of Toyama University, for example, its Regional Technology Development Center organized in 1990 three Advanced Technology Courses, each covering Mechatronics, Electronic Devices and Information Processing. The individual courses enroll ten to fifteen students. Each curricula comprised 52 hours, spreading over two weeks. The students were charged tuition of the amount equivalent to about four-hundred to seven-hundred U.S. dollars.

Informal training of employees through *contracted training or other cooperation schemes between the university and the industry* is not necessarily new. Many business firms have sent their employees to universities on short-term basis to participate in research project. The sent employees may have been registered as a non-degree student, but sometimes they were not given official status at the university. In the past few years, the scale of government-university cooperation have increased dramatically, partly reflecting the needs for additional funds in the university and partly the government policies to encourage close ties with the industry. The number of contracted trainees in national universities and colleges have increased from about seven-hundred in 1979 to more than ten-hundred in 1988. But even more important, the number and amount of academic research grants from business firms have increased dramatically in recent years. Many of these grants entail some form of involvement by employees of the donor company, thus functioning as a means of training in advanced research.

TABLE 22

Graduates Departments Receiving Continuing Education Students - May 1989

	N. of Departments					N. of Institutions
	Total	Engineering	Social Sciences	Education	Others	
Evening Course						
National	2	-	1	1	-	1
Local Public	0	-	-	-	-	0
Private	2	1	-	-	1	2
Total	4	1	1	1	1	3
Day & Evening Course						
National	20	4	6	8	2	17
Local Public	1	-	1	-	-	1
Private	2	1	1	-	-	2
Total	23	5	8	8	2	20
Special Admission						
National	36	17	8	9	2	32
Local Public	5	1	4	-	-	4
Private	20	6	12	1	1	17
Total	61	24	24	10	3	53

Source: MESC.

Admission of working college graduates into *formal graduate courses* have increased in recent years. In was stated that the change in Chartering Standard made it possible to offer a graduate course consisting entirely or partly of evening classes. Based on the new provision, three all-evening courses and twenty day-and-evening courses were created by 1989 (TABLE 22). Many of these courses were set up in national universities. With respect to the fields of study, they were evenly distributed among Engineering, Social Sciences and Education. The revision of the Chartering Standard also made it possible to admit qualified working college graduate to the Doctor's course without requiring a Master's degree. The universities applying this new provision numbered fifty-three in 1989. These moves represent the growing readiness to accept working adults to the existing graduate courses.

At the same time, graduate courses of new types have been set up with curricula targeting at more applied aspects of research. Traditionally Japanese graduate education has been organized around the Chair system, which functions simultaneously as the unit of research, under-graduate and graduate education. Arguably it has deprived flexibility from graduate education. In recent years, a few "independent" graduate schools and courses were established outside the traditional Chair system without associated under-graduate courses. Some of these courses are established independently, and some others are attached to cooperate research centers in the national universities. For example, Hokuriku Graduate School for Advanced Science and Technology has been just created as a completely new institution together with a similar institution at Nara. The Hokuriku Graduate School covers such frontier fields as information sciences and material sciences. The curriculum emphasizes forming basic abilities for independent research, but not necessarily strictly academic in a traditional sense, targeting both fresh graduates and working graduates with various backgrounds. Another example is The Center for Advanced Technology at the University of Tokyo. The Center is financed with close cooperation with the industry, and will start accepting graduate engineers to its own graduate courses.

Graduate courses with innovative curricula have been created recently also in the fields of Social Sciences. Graduate courses in Social Sciences in Japan have been strictly academic with very minor exceptions. The Faculty of Law at the University of Tokyo, for example, has had graduate courses that have been producing leading academics in the field. In 1991, the Faculty decided to create a new graduate course for educating legal experts in such field as Business and Law. The curriculum will emphasize practical aspects and leads only the Master's degree. It is planned that the course will soon start accepting about forty working adults. Similar attempts have been made in various forms, and start attracting students. How these graduate courses will be accepted and demanded remains to be seen. It is unlikely that graduate degrees in Social Sciences will be appreciated by employers for recruitment or promotion. Nonetheless, the value of graduate studies at least in some fields may become recognized soon in some form.

Prospects

In the framework set forward in Section 1, education and training of working college graduates in Japan appears to be characterized as the Corporate Mode as opposed to the Individual Mode. The training often takes place within the company and in working hours; focuses upon specific knowledge and skills closely related to the

present task and the company; and the cost is paid entirely by the company. In so far as the training remains as one belonging to the pure Corporate Mode, the training will be demanded and supplied within the firm. If it have been and will remain true, higher education institutions will have no other role than sending fresh graduates to the firms.

The close analysis revealed, however, even at present there are many factors incorporated to the practice of training for college graduates that are deviating from the Corporate Mode. Moreover the analysis in Section 3 pointed out that, arguably, the Corporate Mode has been becoming increasingly insufficient to accommodate the technological and social changes. Attachment of some factors of Individual Mode of training will then become inevitable. It does not necessarily imply that the whole pattern of training will shift away from the Corporate Mode and towards the Individual Mode. Indeed, many of the elements of the Corporate Mode will remain and sometimes become more powerful. Nor does it imply that the demands for the training of Individual Mode will be formed naturally from the industry or individuals. The demand will arise only when proper forms of training will be supplied.

It is the challenge that the government policies and higher education institutions are facing. Various councils commissioned by the government spent some time in recent years to examine the issue and proposed some specific measures to open university to the needs of educating working graduates. Some of those proposals were translated into specific policy measures such as the changes in Chartering Standards of graduate schools. Many universities responded to the social needs and government initiatives. Consequently, informal and formal opportunities of education and training for working college graduates have been gradually opened. Nonetheless, the move is still in its infancy and its future remains to be seen. If there is anything clear, it is that the future development of higher education in this direction will be critical not only for the future economy, but also for the relevancy of the Japanese universities and colleges to the society.

Conclusions

Mass Higher Education and Its Adaptation to the Economy

It is remarkable in retrospect that Japanese economy succeeded in absorbing the enormous number of college graduates produced by its mass higher education system.

The analysis above revealed that in the 1960s and early 1970s the rapid increases in the flow of graduates into the labor market had in fact induced gradual deterioration of employment condition for higher education graduates, until economic stagnation finally triggered a serious depression of the graduate labor market in the mid-1970s. But the employment condition started improving in the late 1970s, and the trend continued to the present. Past few years have seen serious shortage of fresh college graduates. The recovery is attributable primarily to such economic factors as the robust economic growth, structural shift of the industry and technological development. It should be also noted that the link between higher education and employment has gone through a structural transformation over the periods of depression and recovery. This transformation is considered to have been allowed by flexibility in corporate recruitment policies combined with their extensive internal education and training programs.

In other words, recent favorable employment condition has not been brought out by systematic efforts taken by higher education institutions to improve their relevancy to work. On the contrary, through the redefinition of the link between higher education and work, academic contents of what are taught in higher education institutions have become more remote than ever. It is particularly true in such fields as humanities and social sciences. Even in natural sciences and engineering, where the link appears to remain strong, the values of what are taught in the university have been strongly questioned mainly due to the widening technological gap between the academic and the corporate sectors. It has been frequently argued that college graduates are valued by employers not because of the education that they received, but because they have demonstrated general cognitive abilities by succeeding to pass competitive entrance examination. Education in higher education institutions does not entail significance because, eventually, business firms would provide necessary education and training through in-firm training.

It is thus ironical that in the midst of improving employment condition of the graduates, the confidence on what is learned in higher education has been in fact eroded seriously. Then, does college really matter?

Employment Relevancy of Higher Education in Prospect

Those in higher education community would certainly like to think it does. It is important in this context not to under-estimate what college education does to the students. For the sake of argument, assume that employers evaluate college graduates with respect to three qualities: (i) Basic Intelligence in a general sense; (ii) the Framework of Thought, which constitutes the basis to select and organize information, and to judge over alternative directions of action, and (iii) Specialized Knowledge and skills in particular areas including both technical and non-technical fields.

A college credential can be a proximate for Basic Intelligence. Even though higher education does not contribute to it, selectivity of the institution signals the level of Basic Intelligence. On the other hand, in so far as the university forces the students to attend classes and pass examinations to accumulate credit hours, it can be demonstrated that the students obtained some Specialized Knowledge. The only problem is that in many cases the specific knowledge are too remote, or sometimes outdated, to the content of the job when the student will undertake. In contrast, it is the Framework of Thought that is least visible or recognizable. Yet both employers and the university appear to value this quality most. It is not uncommon to hear the employers to emphasize in effect the importance of this ability value. However, given the absence of its measurement, they have to depend upon selectivity of institution as a proxy. On the other hand, faculty members of higher education institutions often admit impracticality of what they teach, but they essentially argue that the academic exercise would foster the Framework of Thought. It is extremely difficult to prove that the university have in fact contributed in this aspect. It is at least true, however, that the quality can not be automatically derived from raw cognitive ability. One should also admit that good faculty members have made considerable effort to help grow it, and good universities have tried to provide good environment for it to develop.

In the coming decade the value attached to all the three qualities are likely to increase. In order to follow the increasing amount of available information and quick social and technological changes, Basic Intelligence will prove to be even more useful. It is, however, a given to higher education by definition. Needs of new Specialized Knowledge will grow as the frontier of knowledge expands and more specialized. It was observed in Chapter 2 that corporative managers felt shortage in college graduates in particular fields, such as foreign languages and electronics. It was also observed that there are growing number of higher education institutions that started providing education in those fields. Higher education may render significant

contribution in raising its level embodied in its graduates. Most critical, however, will prove to be Framework of Thought that is essential in organizing information and foreseeing the direction of change. It is important to recall in this context that the corporate managers appear to begin laying less emphasis on the ability to process routine work, and more emphasis on the ability to deal with the changing environment, in recruiting fresh graduates. Recognition of such needs appears to be wide-spread. It should have been noticed, however, that those managers themselves are not exactly clear about the nature of quality that they wish to see. Here, the irony is that as the managers try to respond to their challenge they have to seek answers in the field where they are least prepared to deal with. There is no guarantee that the Framework of Thought that the academics try to foster will satisfy the employers. But it is at least true that the university has dealt with this issue for its whole history. It is probably here that the university can make its unique contribution.

The discussion in Chapter 3 also indicated that higher education may potentially extend its scope to working college graduates. It was argued that the Corporate Mode of education and training has been dominant. In many aspects the mode has been efficient and, arguably, contributed to raising productivity of the whole organization. In so far as the training needs of working college graduates are satisfied within the domain of individual corporation, higher education institutions will have little role. But, due to demographic, social and technological changes that the Japanese society is facing, the Corporate Mode of education and training is becoming increasingly insufficient. Instead, the role of Individual Mode of education and training will gain importance, even though it would not replace the Corporate Mode. As a consequence various opportunities of education and training will have to be supplied outside individual firms. Even at present numerous consulting firms, corresponding courses and Special Training Schools are active in this field. But, those agents will become increasingly inadequate, as the demanded knowledge and skill become more advanced and specialized. Then, instruction will have to be structured and closely linked to advanced research. It is what higher education institutions have been traditionally designed for.

Challenges to Higher Education in Prospect

Hence, the potential role of higher education is enormous. In order to realize the potential, however, the higher education system will have to go through considerable transformation. Would it possibly be induced by government policies?

One may recall in this context the period of rapid enrollment expansion in the 1960s and 1970s. In that period, the national government intended to take active roles in matching higher education and employment through manpower planning and higher education policies. Because of the existence of the large private sector, the government did not completely control enrollment in the case of Japan. Nonetheless, the government did in effect induced transformation of the higher education system in many critical ways through newly establishing and expanding the departments that it considered strategically essential to economic growth or social development.

In the coming decade, such a direct and decisive role of the government can not be expected. The demand for college educated labor is diverse and changing constantly, to make the conventional methods of manpower planning almost obsolete. Moreover, what should be transformed is not the number of, and the enrollment in, particular institutions or departments. Rather, it is the contents and the methods of instruction that has to respond to the changing needs. That will not be effectively controlled by the government. Also, since the needs to be satisfied will be diverse, there will be no single model that has been established in a particular field. Various attempts ought to be made and evaluated constantly. Government policies by themselves would not be able to initiate these attempts.

Then, it should be the individual higher education institutions that primarily has to take the challenge. However, at present higher education institutions are not necessarily ready for it. It is beyond the scope of the present study to digress upon the cause and structure of organizational inertia that plagues many Japanese universities and colleges. Suffice to state that the inertia has sufficient ideological and organizational basis to stay, and strong enough in many cases to stifle internal initiatives towards innovations. Also, the favorable employment condition for college graduates appears to be diminishing the motivation to reevaluate the content of education from the perspective of employment relevancy. The financial stringency that national universities are facing has been eroding the educational conditions, thus discouraging necessary innovations [Kaneko 1989]. It should be also noted that the attempts by individual institutions to respond to various needs of education may eventually create confusion on the part of both students and employers. It will be particularly a serious problem with the educational programs for working college graduates. Those problems will not be effectively dealt with by individual institutions.

The government therefore would have a critical role in inducing and encouraging various innovative attempts in higher education institutions. Such a policy should be supplemented by means of evaluating individual institutions and programs, undertaken by various public and voluntary organizations. The government will also

have to take initiatives in standardizing the courses of study and information systems about qualifications. In fact, the government appears to be taking action into these directions. The University Council, by revising the Chartering Standards in 1991, relaxed some of the requirements and encouraged self-evaluation by individual institution. Also the Ministry of Education established a national organization to survey academic qualifications.

These attempts, however, may not be enough. Further efforts will have to be paid to induce innovative attempts in higher education institutions. It remains to be seen whether the efforts of the government and the higher education community will succeed in fostering better links between higher education and employment.

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Statistical Appendix

Appendix Table A-1
Higher Education Institutions and Their Enrollment
By Type and by Control of Institution, May 1991

		Control of Institution				Percent Private (%)
		All	National	Local/ Public	Private	
NUMBER OF ESTABLISHMENT						
4-Year Institutions		514	97	39	378	73.5
2-Year Institutions		592	41	54	497	84.0
Technical Colleges		63	54	5	4	6.3
Special Training Schools	1)	2,785	150	173	2,462	88.4
ENROLLMENT (in thousands)						
Graduate Courses		99	63	4	31	31.3
Undergraduate						
Total		2,761	519	85	2,157	78.1
4-Year Institutions		2,107	466	62	1,579	74.9
2-Year Institutions		504	18	23	463	91.9
Corresponding Courses		150	35	-	115	76.7
Post-Secondary						
Technical Colleges	2)	20	17	2	1	5.0
Special Training Schools	3)	658	17	26	615	93.5
All Levels		3,538	616	117	2,804	79.3

Source: MESC, Quick Report of the 1991 Fundamental School Survey.
Notes: 1) Post-Secondary courses only.
2) Total of students at 4th and 5th year.
3) Post-Secondary courses only.

Appendix Table A-2

Enrollment by Broad Category of Departments and by Type of Establishment

- Universities, 1989 -

	N. of Students				% Shares			
	Total	National	Local Public	Private	Total	National	Local Public	Private
All Departments	1,929,137	424,144	53,379	1,451,614	100.0	100.0	100.0	100.0
HSS	1,126,002	114,135	33,104	978,763	58.4	26.9	62.0	67.4
Humanities	290,387	27,437	11,334	251,616	15.1	6.5	21.2	17.3
Social Sciences	759,636	68,777	18,899	671,960	39.3	16.2	35.4	46.3
Liberal Arts & Related	28,974	15,476	608	12,890	1.5	3.6	1.1	0.9
Fine/Performing Arts	47,005	2,445	2,263	42,297	2.4	0.6	4.2	2.9
NSE	510,064	180,996	9,582	319,486	26.4	42.7	18.0	22.0
Natural Sciences	63,997	26,922	1,911	35,164	3.3	6.4	3.6	2.4
Engineering	379,405	120,049	6,260	253,096	19.7	28.3	11.7	17.4
Agriculture	64,975	32,338	1,411	31,226	3.4	7.6	2.7	2.2
Merchandise-Marine	1,687	1,687	-	-	0.1	0.4	0.0	0.0
HWE	293,071	129,013	10,693	153,365	15.2	30.4	20.0	10.6
Health/Medicine	117,712	38,039	6,406	73,267	6.1	9.0	12.0	5.0
Home Science	35,794	1,216	2,890	31,688	1.9	0.3	5.4	2.3
Education	139,565	89,758	1,397	48,410	7.2	21.1	2.7	3.3

Source: School Fundamental Survey 1989, Table 11.

Appendix Table A-3
Enrollment by Broad Category of Department
- Universities, 1989 -

	No. of Students			% Shares		
	Total	Male	Female	Total	Male	Female
All Departments	1,929,137	1,410,854	518,283	100.0	100.0	100.0
HSS	1,126,002	798,881	327,121	58.4	56.6	63.1
Humanities	290,387	101,997	188,390	15.1	7.2	36.3
Social Sciences	759,636	660,659	98,977	39.4	46.8	27.3
Liberal Arts & Related	28,974	19,788	9,186	1.5	1.4	1.8
Fine Arts/Performing Art	47,005	16,437	30,568	2.4	1.2	5.9
NSE	510,064	473,210	36,854	26.4	33.5	7.1
Natural Sciences	63,997	52,302	11,695	3.3	3.7	2.3
Engineering	379,405	366,565	12,840	19.7	26.0	2.5
Agriculture	64,975	52,730	12,245	3.4	3.7	2.4
Merchandise-Marine	1,687	1,613	74	0.1	0.1	0.0
HWE	293,071	138,763	154,308	15.2	9.8	29.8
Health/Medicine	117,712	73,846	43,866	6.1	5.2	8.5
Home Science	35,794	455	35,339	1.9	0.0	6.8
Education	139,565	64,462	75,103	7.2	4.6	14.5

Source: School Fundamental Survey 1989, Table 41.

Appendix Table A-4
Enrollment by Broad Category of Department
- Junior Colleges, 1989 -

	N. of Students			% Shares		
	Total	Male	Female	Total	Male	Female
All Departments	455,696	40,174	415,522	100.0	100.0	100.0
HSS	204,550	15,792	188,758	44.9	39.3	45.4
Humanities	115,746	1,849	113,897	25.4	4.6	27.3
Social Sciences	55,489	12,056	43,433	12.2	30.0	10.5
Liberal Arts	12,349	87	12,262	2.7	0.2	3.0
Fine Arts	20,966	1,800	19,166	4.6	4.5	4.6
NSE	27,017	20,525	6,492	5.9	51.1	1.6
Engineering	23,215	17,899	5,316	5.1	44.6	1.3
Agriculture	3,802	2,626	1,176	0.8	6.5	0.3
HWE	224,129	3,857	220,272	49.2	9.6	53.0
Health/Medicine	25,483	3,113	22,370	5.6	7.7	5.4
Home Science	114,540	252	114,288	25.1	0.6	27.5
Education	78,588	447	78,141	17.2	1.1	18.8
Others	5,518	45	5,473	1.3	0.2	1.3

Source: School Fundamental Survey 1989, Table 41.

Appendix Table A-5
Enrollment by Field of Study - Special Training Schools, 1989

	N. of Students			% Shares		
	Total	Male	Female	Total	Male	Female
All Fields	559,046	260,508	298,538	100.0	100.0	100.0
Industry	158,441	133,132	25,309	28.3	51.1	8.5
Agriculture	1,266	1,050	216	0.3	0.4	0.1
Health	116,327	21,146	95,181	20.8	8.1	31.8
Nutrition/Cosmetology	34,164	13,415	20,749	6.1	5.1	7.0
Education /Social Work	22,388	3,380	19,008	4.0	1.3	6.4
Business	100,505	44,666	55,839	18.0	17.2	18.7
Commerce	2,183	1,221	962	0.4	0.5	0.3
Accounting	34,158	20,263	13,895	6.1	7.8	4.7
Typing	623	14	609	0.1	0.0	0.2
Secretary	14,514	188	14,326	2.6	0.1	4.8
Management	7,138	4,937	2,201	1.3	1.9	0.7
Others	41,889	18,043	23,846	7.5	6.9	8.0
Home Science	46,466	5,262	41,204	8.3	2.0	13.8
Culture	79,489	38,457	41,032	14.2	14.8	13.7
Music	5,350	3,454	1,896	1.0	1.3	0.6
Fine Arts	3,819	1,951	1,868	0.7	0.7	0.6
Graphic Design	25,326	14,231	11,095	4.5	5.5	3.7
Tea/Flower Arrangement	150	13	137	0.0	0.0	0.0
Foreign Language	17,036	4,302	12,734	3.0	1.7	4.3
Drama/Cinema	4,769	3,390	1,379	0.9	1.3	0.5
Photography	2,255	1,757	498	0.4	0.7	0.2
Translator	5,590	730	4,860	1.0	0.3	1.6
Others	15,194	8,629	6,565	2.7	3.3	2.2

Source: School Fundamental Survey 1989, Table 189.
Note: Post-Secondary Level of STS only.

Appendix Table A-6

Changes in Enrolment of Universities by Departments

	Total	HSS					HSE					HWE				
		(Total)	Humanities	Social Sciences	Liberal Arts & Related	Fine/ Performing Arts	(Total)	Natural Sciences	Engineering	Agriculture	Merchandise Marine	(Total)	Health Related	Home Science	Education	Physical Exercise
1960	601,464	367,485	92,505	247,319	18,336	9,325	138,247	16,206	92,572	28,040	1,429	95,732	28,317	8,203	55,416	3,796
1961	644,022	393,844	99,673	264,551	19,419	10,201	152,795	17,535	104,528	29,277	1,455	97,383	29,399	8,830	55,216	3,938
1962	699,200	427,106	107,429	287,284	21,241	11,152	171,430	19,114	119,590	31,213	1,513	100,664	30,328	9,987	55,686	4,663
1963	762,749	463,757	116,943	316,161	18,040	12,613	195,784	21,537	139,425	33,286	1,536	103,208	31,832	10,805	55,255	5,316
1964	817,751	495,390	125,640	336,874	19,116	13,760	215,374	23,863	155,096	34,855	1,560	106,987	33,328	12,104	55,672	5,883
1965	895,465	542,081	138,722	367,016	20,584	15,759	240,180	27,220	174,655	36,721	1,584	113,204	35,613	13,758	56,881	6,952
1966	992,496	606,287	159,741	405,132	23,236	18,178	264,096	29,987	193,970	38,532	1,607	122,113	38,056	16,470	58,769	8,818
1967	1,103,886	673,270	182,746	443,897	25,062	21,565	297,603	33,267	220,499	42,215	1,622	133,013	41,788	19,226	61,377	10,622
1968	1,211,068	729,329	160,957	511,614	31,588	25,170	328,280	38,414	242,816	45,398	1,652	153,459	46,418	21,324	85,717	-
1969	1,295,771	774,551	171,867	543,037	31,267	28,380	358,413	39,957	268,437	48,361	1,658	162,807	49,658	23,069	90,080	-
1970	1,344,358	798,919	170,907	562,162	36,128	29,722	377,249	42,071	283,674	49,853	1,651	168,190	52,279	23,292	92,619	-
1971	1,404,186	829,651	177,661	582,380	37,584	32,026	398,394	43,061	301,089	52,609	1,635	176,141	55,303	23,932	96,906	-
1972	1,459,548	871,342	188,621	612,197	36,434	34,090	406,395	43,549	308,326	52,816	1,704	181,811	57,435	24,402	99,974	-
1973	1,523,074	909,404	199,225	634,835	39,232	36,112	420,995	46,527	317,606	55,099	1,763	192,675	60,488	25,692	106,495	-
1974	1,585,674	946,240	206,394	660,276	41,601	37,969	434,529	49,532	326,121	57,048	1,828	204,905	64,946	27,081	112,878	-
1975	1,652,003	965,872	215,933	688,667	22,308	38,964	445,041	50,225	333,959	58,996	1,861	241,090	92,523	29,081	119,486	-
1976	1,702,235	994,175	223,462	707,314	22,811	40,588	453,060	51,543	339,713	59,922	1,882	255,000	98,253	30,488	126,259	-
1977	1,747,057	1,020,202	230,923	723,996	22,577	42,706	460,978	53,005	345,680	60,431	1,862	265,877	103,380	31,308	131,189	-
1978	1,769,331	1,031,955	235,720	729,506	22,931	43,798	464,537	54,525	347,988	60,146	1,878	272,839	107,545	31,996	133,298	-
1979	1,754,343	1,021,022	239,359	716,171	21,346	44,146	457,791	54,578	341,790	59,569	1,854	275,530	109,748	31,851	133,931	-
1980	1,741,504	1,010,806	239,990	704,737	21,921	44,158	453,499	54,579	337,767	59,558	1,595	277,199	112,058	31,930	133,211	-
1981	1,725,814	997,750	239,624	692,268	21,747	44,111	449,714	55,033	334,009	59,149	1,523	278,350	113,100	31,667	133,583	-
1982	1,716,956	988,159	239,486	681,046	23,444	44,183	449,163	55,188	333,387	59,072	1,516	279,634	114,457	31,453	133,724	-
1983	1,729,632	990,526	243,684	680,141	22,043	44,658	457,691	57,597	338,990	59,562	1,542	281,415	115,861	31,844	133,710	-
1984	1,734,080	988,132	245,489	675,501	22,009	45,133	462,218	58,446	342,456	59,777	1,539	283,730	117,071	31,948	134,711	-
1985	1,734,392	984,287	246,850	671,001	21,546	44,890	464,884	59,678	343,590	60,068	1,548	285,221	117,809	32,185	135,227	-
1986	1,758,635	998,564	253,010	678,842	21,514	45,198	472,229	60,306	349,579	60,792	1,552	287,842	118,456	32,893	136,493	-
1987	1,806,024	1,032,729	262,287	700,750	24,163	45,529	482,584	61,076	358,490	61,417	1,601	290,711	118,948	33,749	138,014	-
1988	1,861,306	1,074,934	274,098	728,380	26,643	45,813	496,423	61,932	368,207	62,649	1,635	291,949	118,438	34,552	138,959	-
1989	1,929,137	1,126,002	290,387	759,636	28,974	47,005	510,064	63,997	379,405	64,975	1,687	293,071	117,712	35,794	139,565	-

Source: KIME Higher Education Databook.

Appendix Table A-7

Changes in Enrollment in Junior Colleges by Departments

	Total	HSS					NSE				HWE				
		(Total)	Humanities	Social Sciences	Liberal Arts	Fine/ Performing Arts	(Total)	Natural Sciences	Engineering	Agriculture	(Total)	Health Related	Home Science	Education	Physical Exercise
1960	81,528	33,928	16,141	14,622	-	3,165	10,752	199	9,200	1,353	36,848	465	30,508	4,419	1,456
1961	91,245	38,142	18,328	16,334	-	3,480	12,247	120	10,635	1,492	40,856	471	34,094	4,764	1,527
1962	105,182	43,742	20,844	18,791	-	4,107	14,140	132	12,419	1,589	47,300	479	39,521	5,698	1,602
1963	119,767	48,879	23,586	21,271	-	4,022	15,509	154	13,646	1,709	55,379	474	46,369	6,842	1,694
1964	125,566	51,445	25,347	21,895	-	4,203	16,085	160	14,203	1,722	58,036	446	48,162	7,770	1,658
1965	145,458	58,139	31,675	22,093	-	4,371	16,992	195	14,887	1,910	70,327	494	56,759	11,276	1,798
1966	192,083	72,477	42,613	24,174	-	5,690	19,990	604	17,013	2,373	99,616	553	77,428	19,351	2,284
1967	231,779	84,615	51,140	25,571	-	7,904	23,653	1,271	19,566	2,816	123,511	788	91,199	28,872	2,652
1968	251,637	91,938	46,669	29,628	4,747	10,894	24,875	152	21,380	3,343	134,824	4,743	91,600	38,481	-
1969	259,329	96,400	49,613	29,997	4,682	12,108	25,734	189	22,123	3,422	137,195	5,496	89,806	41,893	-
1970	259,747	98,994	51,475	30,187	4,646	12,686	25,496	194	21,799	3,503	135,257	5,827	85,017	44,413	-
1971	271,573	106,280	56,288	31,773	4,731	13,488	26,283	171	22,585	3,527	139,010	6,265	84,536	48,209	-
1972	284,165	111,785	59,671	32,323	5,089	14,702	25,875	187	22,266	3,422	146,505	6,767	85,365	54,373	-
1973	305,782	119,928	64,410	33,975	5,544	15,999	28,001	166	24,108	3,727	157,853	7,386	88,188	62,279	-
1974	326,163	128,153	69,393	35,801	5,838	17,121	27,630	151	23,429	4,050	170,380	8,043	92,513	69,824	-
1975	348,922	135,848	73,645	37,915	6,421	17,867	27,675	167	23,335	4,173	185,399	10,023	97,369	78,007	-
1976	360,026	137,208	74,848	37,828	6,674	17,858	27,316	160	22,802	4,354	195,502	11,614	98,440	85,448	-
1977	369,397	139,795	76,892	37,205	6,995	18,703	26,520	177	21,859	4,484	203,082	13,214	99,797	90,071	-
1978	375,666	141,629	79,102	35,615	7,167	19,745	26,883	187	22,242	4,454	207,154	14,494	101,457	91,203	-
1979	369,449	140,329	79,026	34,552	6,990	19,761	25,680	170	21,150	4,360	203,440	15,102	99,087	89,251	-
1980	366,248	138,746	79,008	33,499	7,044	19,195	24,409	156	20,093	4,160	203,093	15,829	97,894	89,370	-
1981	367,462	139,641	79,581	33,585	7,106	19,369	23,674	179	19,449	4,046	204,147	16,788	98,625	88,734	-
1982	369,365	141,313	79,970	33,975	7,719	19,649	23,591	224	19,410	3,957	204,461	18,086	99,320	87,055	-
1983	374,535	144,938	81,507	35,036	8,836	19,559	24,681	271	20,298	4,112	204,916	18,893	100,912	85,111	-
1984	377,107	149,245	83,642	36,379	10,064	19,160	24,362	291	19,961	4,110	203,500	20,072	100,558	82,870	-
1985	366,180	149,670	85,056	35,990	10,617	18,007	24,170	277	19,787	4,106	192,340	20,544	95,617	76,179	-
1986	391,078	165,630	94,857	40,186	12,201	18,386	25,121	288	20,719	4,114	200,327	21,546	102,073	76,708	-
1987	432,393	189,940	108,056	47,180	14,849	19,855	27,177	319	22,674	4,184	215,276	22,934	112,126	80,216	-
1988	444,808	200,557	112,524	51,704	16,070	20,259	27,748	331	23,412	4,005	216,503	24,129	113,500	78,874	-
1989	455,696	209,737	115,746	55,489	17,536	20,966	27,348	331	23,215	3,802	218,611	25,483	114,540	78,588	-

Source: RIHE Higher Education Databook.

Appendix Table A-8

Changes in Female Share (%) by Fields of Study - Universities

	Total	HSS								NSE					HWE			
		(Total)	Humanities	Social Sciences (Total)	Law	Economics	Sociology	Liberal Arts & Related	Fine/ Performing Arts	(Total)	Natural Sciences	Engineering	Agriculture	Merchandise Marine	(Total)	Health Related	Home Science	Education
1960	13.7	9.9	32.0	1.4	2.2	0.8	7.2	-	54.3	1.8	11.1	0.3	1.0	0.0	36.7	26.7	99.1	31.5
1961	14.5	10.2	34.8	1.4	2.1	0.8	7.7	-	55.4	1.9	11.7	0.4	1.0	0.0	40.8	27.5	99.6	37.8
1962	14.4	10.2	36.0	1.3	2.0	1.0	2.6	-	55.0	1.9	11.4	0.4	1.5	0.0	42.2	27.7	99.3	39.9
1963	14.9	11.2	39.0	1.4	2.2	1.0	4.1	-	59.2	2.1	13.1	0.5	1.6	0.0	44.2	28.1	99.4	41.6
1964	15.8	12.5	42.6	1.6	2.6	1.2	2.6	-	57.3	2.3	13.4	0.5	2.5	0.0	47.3	31.7	99.6	45.1
1965	16.2	13.4	45.9	1.9	2.7	1.4	4.9	-	59.5	2.1	12.1	0.4	2.3	0.0	49.2	32.5	99.8	47.0
1966	16.7	14.2	48.5	2.0	3.1	1.5	3.2	-	61.3	2.3	13.1	0.4	2.9	0.0	51.1	33.1	99.9	49.0
1967	17.0	14.7	49.0	2.2	3.5	1.7	6.0	-	65.6	2.3	13.7	0.4	2.9	0.0	52.8	34.8	99.7	50.7
1968	17.1	14.0	52.9	3.3	3.0	1.4	21.9	67.9	58.9	2.2	12.7	0.4	3.0	0.0	52.2	38.3	99.9	49.6
1969	18.7	16.2	57.7	4.0	3.7	1.9	25.3	70.5	66.7	2.4	13.9	0.4	3.7	0.0	54.5	38.1	99.6	51.0
1970	20.2	17.7	58.9	4.7	4.3	2.3	31.2	73.6	70.2	2.7	14.3	0.5	5.4	0.0	57.4	40.6	99.8	52.2
1971	19.5	17.2	56.9	4.9	4.8	2.4	28.1	71.1	65.9	2.9	15.5	0.6	5.3	0.0	56.1	38.9	99.7	51.9
1972	19.4	17.1	56.4	5.1	4.5	2.5	29.1	54.0	64.6	3.1	15.5	0.7	5.8	0.0	56.0	39.3	99.7	52.0
1973	19.3	17.1	55.6	5.3	5.3	2.6	28.8	58.1	63.3	2.9	14.8	0.7	6.3	0.0	56.3	39.2	99.7	53.4
1974	19.8	17.7	57.2	5.8	5.4	3.0	30.3	49.6	61.9	3.1	14.1	0.7	7.2	0.0	56.4	38.2	99.5	54.5
1975	21.6	19.7	60.3	6.9	6.8	3.7	33.3	52.6	61.9	3.5	15.1	0.9	8.5	0.0	58.9	40.9	99.5	58.1
1976	22.7	21.2	62.7	7.7	7.3	4.2	34.4	57.9	62.5	3.6	15.7	0.8	9.2	0.0	59.7	40.8	99.5	60.0
1977	23.7	22.3	64.4	8.4	7.7	4.9	36.4	54.9	62.1	3.8	16.0	0.9	9.5	0.0	60.0	40.6	99.6	61.3
1978	24.1	22.6	64.7	8.8	8.3	5.2	36.4	49.9	62.9	3.9	15.7	1.0	9.9	0.0	60.3	40.1	99.7	62.1
1979	24.5	23.2	65.1	9.1	8.0	5.8	35.8	52.3	65.2	3.9	15.9	1.0	9.6	0.0	59.3	38.2	99.7	60.7
1980	24.7	23.3	64.5	9.1	8.0	6.1	34.3	51.3	65.8	4.3	17.2	1.2	10.2	0.0	58.9	38.7	99.6	59.9
1981	24.7	23.4	64.2	9.3	8.0	6.2	34.5	48.3	66.5	4.6	17.7	1.3	11.1	0.0	57.9	38.1	99.5	57.8
1982	24.2	22.7	62.6	8.8	8.1	5.5	33.4	45.6	66.7	4.7	16.7	1.5	11.5	0.0	56.4	37.3	99.5	54.9
1983	24.4	22.9	61.8	8.9	8.8	5.5	33.0	44.8	66.6	5.1	17.6	1.6	12.2	0.0	55.3	36.8	99.4	53.3
1984	24.6	23.2	61.8	9.0	8.8	5.6	33.5	43.4	66.8	5.7	17.5	2.1	13.6	1.6	54.8	35.9	99.2	53.0
1985	24.7	23.1	61.5	9.1	9.5	5.4	33.0	44.4	67.6	6.2	18.9	2.3	14.4	0.6	55.2	36.6	99.2	53.2
1986	24.9	23.4	61.7	9.1	9.5	5.4	33.7	45.0	67.0	6.7	20.0	2.7	15.3	3.8	55.1	37.2	99.4	52.4
1987	25.9	24.7	63.2	9.9	10.9	6.0	32.6	46.2	67.9	7.0	19.8	3.1	15.9	3.7	56.5	38.8	99.2	54.3

Appendix Table B-1
Employment Status of Graduates by Field of Study - Males, University, 1989

	N. of Graduates	Male Distribution over Employment Status (%)				
		Total	Further Education	Employed	Temporary Work	Not Employed/ Unknown
All Fields	276,048	100.0	10.0	80.1	0.6	9.3
Humanities	19,574	100.0	5.4	71.9	1.2	21.5
Social Sciences	129,707	100.0	0.8	88.4	0.4	10.4
Fine Arts/Performing Arts	3,336	100.0	8.9	64.0	4.6	22.5
Natural Sciences	10,722	100.0	25.6	67.4	0.4	6.6
Engineering	73,185	100.0	16.7	80.7	0.0	2.6
Agriculture	10,924	100.0	15.3	77.8	0.6	6.3
Merchandise-Marine	322	100.0	36.6	62.1	0.0	1.3
Health-Related	12,835	100.0	59.4	27.2	0.2	13.2
Home Science	52	100.0	1.9	88.5	0.0	9.6
Education	14,384	100.0	4.9	73.7	4.9	16.5
Others	1,007	100.0	6.9	85.0	0.8	7.3

Appendix Table B-2
Employment Status of Graduates by Field of Study - Females, University, 1989

	N. of Graduates	Female Distribution over Employment Status (%)				
		Total	Further Education	Employed	Temporary Work	Not Employed/ Unknown
All Fields	100,640	100.0	4.8	78.4	2.2	14.6
Humanities	36,343	100.0	2.3	81.0	1.4	15.3
Social Sciences	16,077	100.0	1.8	82.3	1.4	14.5
Fine Arts/Performing Arts	6,743	100.0	5.7	68.8	4.8	20.7
Natural Sciences	2,573	100.0	14.7	78.9	0.6	5.8
Engineering	2,493	100.0	11.4	85.4	0.2	3.0
Agriculture	1,962	100.0	8.7	83.0	0.5	7.8
Merchandise-Marine	8	100.0	87.5	12.5	0.0	0.0
Health-Related	8,504	100.0	20.1	65.2	0.4	14.3
Home Science	7,629	100.0	2.0	85.9	1.5	10.6
Education	17,604	100.0	3.1	75.1	5.4	16.4
Others	704	100.0	3.1	76.6	2.4	17.9

Appendix Table B-3
Employment Status of Graduates by Field of Study - Junior College, 1989

	N. of Graduates	Distribution over Employment Status (%)				
		Total	Further Education	Employed	Temporary Work	Not Employed/ Unknown
All Fields	205,098	100.0	3.1	85.0	1.4	10.5
Humanities	54,573	100.0	2.3	85.9	1.4	10.4
Social Sciences	22,211	100.0	3.9	84.0	1.3	10.8
Liberal Arts	5,279	100.0	3.7	83.4	0.7	12.2
Fine Arts/Performing Arts	9,402	100.0	14.5	64.5	2.4	18.6
Engineering	9,051	100.0	6.8	82.3	1.4	9.5
Agriculture	1,850	100.0	13.6	71.9	1.7	12.8
Health-Related	8,129	100.0	8.0	82.2	1.1	8.7
Home Science	54,766	100.0	1.3	86.9	0.9	10.9
Education	37,343	100.0	1.5	88.2	1.8	8.5
Others	2,494	100.0	0.4	93.6	0.7	5.3

Appendix Table B-4
Employment Status of Speical Training School Graduates

(%)

	Employed and Self-Employed	Studying	Employed and Enrolled	Helping House-hold	Unemployed	Others
Engineering	96.5	0.8	2.4	-	-	0.3
Agriculture	87.7	2.8	1.0	1.0	0.9	6.6
Health-Related	88.6	7.3	0.5	0.2	0.9	2.5
Nutrition/ Cosmetology	87.5	1.2	6.0	1.7	0.7	2.9
Education/ Social Services	92.1	1.6	1.1	0.8	1.0	3.4
Business	95.2	1.1	1.7	1.0	-	1.0
Home Science	57.9	20.6	8.3	4.6	2.4	6.2
Culture/ Liberal Arts	81.9	6.6	4.5	2.1	0.8	4.1

Source: Survey on Special Training Schools 1990, Table 44, page 39.

Appendix Table B-5

Direct Advancement/Employment Rate by Field of Study - University, Males

(%)

	All Fields	Humanities	Social Sciencs	Fine/ Performing Arts	Natural Sciences	Engineering	Agriculture	Merchandise Marine	Health-Related	Home Science	Education	Others
1960	89.8	85.1	92.5	86.8	97.0	98.0	93.0	98.5	96.2	93.8	91.4	-
1961	91.7	89.4	93.7	85.6	97.1	98.1	94.9	98.9	96.2	100.0	95.9	-
1962	92.8	88.2	95.2	91.5	97.4	98.3	96.7	99.6	97.7	100.0	97.0	-
1963	93.0	87.7	95.2	89.6	97.7	97.9	96.3	98.5	97.6	91.7	98.3	-
1964	92.8	90.0	93.8	93.4	97.3	98.4	94.4	100.0	98.0	100.0	98.4	-
1965	91.9	87.2	92.9	91.7	96.4	98.2	91.7	98.2	97.3	100.0	96.3	-
1966	90.0	81.9	91.1	89.0	93.9	97.5	88.0	98.9	93.5	100.0	93.4	-
1967	90.5	81.3	91.8	82.2	93.0	97.0	90.8	97.9	94.9	75.0	93.8	-
1968	91.1	81.9	92.1	86.0	92.7	97.6	92.3	98.6	96.9	75.0	88.3	92.5
1969	89.0	77.2	89.7	78.6	90.7	96.3	90.2	99.7	69.4	92.9	86.9	84.9
1970	88.5	76.0	88.9	63.0	89.0	96.6	90.5	99.0	76.3	84.6	86.7	83.8
1971	88.2	75.8	88.0	74.3	88.8	97.0	90.7	98.1	81.0	92.9	84.7	71.1
1972	85.3	71.7	85.1	66.2	83.9	95.1	89.1	98.2	80.9	100.0	81.4	81.4
1973	84.3	70.1	84.0	65.7	81.4	93.6	87.4	92.1	82.2	94.1	82.1	80.4
1974	85.2	69.7	84.9	68.6	86.5	94.6	88.7	96.3	79.1	96.3	84.2	88.2
1975	83.1	67.4	82.9	54.2	84.6	93.1	82.0	96.4	77.4	92.9	82.2	86.3
1976	80.4	65.0	80.2	56.1	80.2	90.7	80.4	91.2	77.5	75.9	76.9	87.6
1977	81.5	66.2	81.2	59.7	80.6	92.4	81.8	91.1	81.8	86.7	75.9	89.3
1978	80.9	67.4	80.3	56.6	80.7	92.3	79.8	92.5	83.2	66.7	77.3	93.5
1979	82.1	68.3	81.7	62.0	80.5	93.7	82.0	89.8	83.8	90.9	76.6	91.2
1980	83.6	69.2	83.9	65.5	82.9	94.4	88.6	96.4	85.0	85.7	75.0	91.1
1981	84.3	69.8	85.1	66.4	83.6	94.8	88.5	96.3	84.8	76.3	75.4	89.7
1982	84.9	70.0	85.9	65.4	83.5	96.0	89.7	97.9	83.5	91.9	75.5	92.3
1983	84.8	72.4	86.0	67.7	85.7	95.7	88.8	99.7	85.3	85.4	73.3	89.2
1984	85.2	74.8	86.8	65.8	86.5	96.0	89.2	99.7	87.5	79.3	72.7	86.6
1985	85.7	74.9	87.0	66.4	88.1	96.9	89.2	99.0	87.6	71.0	74.0	91.3
1986	86.0	74.6	87.7	68.7	89.2	96.6	89.8	99.3	86.5	71.7	74.1	90.9
1987	85.7	73.3	86.8	67.3	90.0	96.7	90.5	99.7	87.8	80.6	74.5	88.2
1988	86.4	75.0	87.7	68.5	91.4	97.1	91.3	97.8	85.7	91.1	72.6	89.7
1989	87.9	77.3	89.2	72.9	93.1	97.5	93.2	98.8	86.6	90.4	78.6	91.9

Note: Proportion of those who entered graduate courses or went to permanent employment directly after graduation.

Appendix Table B-6

Direct Advancement/Employment Rate by Field of Study - University, Females

(%)

	All Fields	Humanities	Social Sciences	Fine/ Performing Arts	Natural Sciences	Engineering	Agriculture	Merchandise Marine	Health-Related	Home Science	Education	Others
1960	68.3	58.5	60.3	62.0	92.3	96.0	80.3	98.5	80.7	58.2	86.8	-
1961	72.9	61.7	63.3	64.9	93.0	95.8	90.5	98.9	85.0	64.0	91.1	-
1962	72.8	62.8	64.0	60.6	92.9	93.0	93.8	99.6	80.8	63.0	91.2	-
1963	73.6	61.7	66.3	64.3	93.2	97.3	95.2	98.5	85.8	65.5	94.4	-
1964	73.8	63.2	62.6	70.6	91.1	94.9	90.2	100.0	87.5	63.3	93.9	-
1965	69.5	58.0	57.2	70.5	91.3	93.9	82.3	98.2	87.5	60.4	90.7	-
1966	64.9	51.7	46.2	66.9	88.8	94.3	77.1	98.9	87.7	58.2	89.0	-
1967	65.2	53.8	45.7	67.6	90.6	91.0	84.6	97.9	84.7	55.4	89.9	-
1968	67.1	55.7	57.1	68.1	87.9	84.7	81.7	98.6	85.5	56.5	85.8	47.3
1969	64.3	51.6	58.3	61.1	86.3	84.0	80.7	99.7	81.0	56.7	85.9	45.0
1970	61.9	51.4	57.7	45.3	86.8	88.6	76.3	99.0	82.7	56.2	83.1	42.3
1971	62.8	52.1	57.3	54.1	86.1	84.8	83.3	98.1	82.8	58.4	81.6	43.0
1972	60.0	49.4	51.3	53.7	81.5	89.0	73.4	98.2	78.4	58.5	80.2	48.6
1973	62.5	54.2	54.7	56.4	81.4	85.5	74.3	92.1	75.7	61.6	79.4	50.0
1974	66.0	59.7	56.2	54.1	84.4	87.7	78.8	96.3	77.9	66.4	82.1	61.4
1975	65.0	57.9	59.3	55.9	80.7	84.7	72.6	96.4	77.2	63.9	80.3	49.2
1976	59.7	51.1	54.5	53.3	74.9	81.9	70.0	91.2	73.3	58.9	76.0	47.1
1977	61.5	54.8	57.8	54.7	76.2	84.8	75.0	91.1	71.8	62.4	74.2	49.0
1978	62.4	57.1	58.7	53.5	76.0	85.6	67.5	92.5	71.3	61.7	75.0	48.2
1979	65.1	59.9	62.4	56.4	76.6	83.7	75.0	89.8	73.2	65.6	77.4	50.0
1980	67.8	63.7	66.4	61.0	80.5	89.1	79.5	96.4	77.8	69.9	75.3	51.2
1981	69.9	67.2	68.2	63.5	82.5	87.4	84.7	96.3	77.4	73.2	75.0	61.7
1982	71.7	69.5	70.4	63.6	84.8	92.9	86.5	97.9	79.9	75.6	74.8	71.9
1983	72.0	70.5	73.0	64.6	85.5	90.9	83.9	99.7	80.3	75.8	72.8	67.3
1984	73.5	73.4	74.4	65.6	86.7	91.9	86.4	80.0	82.3	76.6	71.7	70.4
1985	75.4	75.9	77.0	65.9	89.2	94.6	87.0	100.0	81.3	80.2	72.8	71.0
1986	76.7	77.8	78.3	67.1	90.3	95.6	90.0	100.0	80.7	81.4	73.9	72.9
1987	77.0	77.3	79.1	69.0	91.0	95.0	89.9	100.0	83.1	82.1	73.5	73.9
1988	78.5	79.4	81.0	71.8	92.6	96.2	90.2	100.0	83.4	84.0	73.2	77.7
1989	81.9	83.3	84.2	74.5	93.7	96.9	91.7	100.0	85.4	88.0	78.2	79.7

Note: Proportion of those who entered graduate courses or went to permanent employment directly after graduation.

Appendix Table B-7

Direct Advancement/Employment Rate by Field of Study - Junior College, Females

(%)

	All Fields	Humanities	Social Sciences	Fine/ Performing Arts	Natural Sciences	Engineering	Agriculture	Merchandise Marine	Health-Related	Home Science	Education	Others
1960	54.1	56.3	71.5	63.8	-	97.1	68.6	45.0	80.3	84.1	71.6	-
1961	58.4	59.3	79.9	80.3	-	100.0	75.0	50.1	87.0	86.6	62.3	-
1962	56.7	58.2	76.6	93.3	-	95.7	86.0	49.1	83.6	86.6	56.7	-
1963	59.8	61.7	74.2	70.7	-	94.1	81.7	52.2	87.5	88.0	61.9	-
1964	63.1	67.0	68.8	83.8	-	94.3	77.9	55.0	93.2	87.0	78.3	-
1965	61.4	62.8	74.9	92.4	-	94.0	80.4	53.6	93.1	89.7	69.2	-
1966	57.7	54.6	77.3	77.2	-	82.4	80.7	50.0	93.4	89.1	64.9	-
1967	58.9	59.8	68.6	83.6	-	87.2	64.7	50.1	78.8	87.9	66.2	-
1968	62.4	61.9	73.3	91.7	60.2	91.7	84.8	53.3	85.8	86.6	57.4	52.7
1969	68.2	65.3	74.7	89.7	67.5	82.2	79.5	60.3	91.5	88.3	64.2	55.0
1970	71.3	68.6	73.9	95.7	64.3	88.4	90.5	65.2	92.8	88.5	60.0	57.7
1971	72.0	68.4	78.5	91.5	61.2	84.0	80.6	66.6	88.8	86.7	63.4	57.0
1972	72.0	68.5	76.5	94.6	60.2	80.7	77.4	65.1	88.3	88.4	64.5	51.4
1973	75.8	73.5	77.8	95.0	68.1	77.9	81.9	70.7	91.0	88.0	67.1	50.0
1974	78.2	76.0	77.3	93.0	72.6	84.3	86.0	73.5	90.6	89.7	66.3	38.6
1975	75.6	73.6	76.5	98.3	70.9	87.0	81.3	70.2	89.3	87.4	62.6	50.8
1976	71.5	67.8	71.8	86.1	62.3	81.3	74.2	66.5	86.2	82.9	63.3	52.9
1977	73.5	73.0	76.7	100.0	68.3	78.4	78.7	68.9	82.7	80.2	64.7	51.0
1978	73.1	71.4	74.7	90.0	68.2	70.9	81.7	69.5	87.2	78.8	64.0	51.8
1979	74.5	74.1	78.8	90.6	73.0	83.2	72.6	71.6	88.3	77.0	67.3	50.0
1980	78.7	79.8	82.2	92.0	79.6	84.7	83.6	77.3	89.7	79.0	69.2	48.8
1981	80.8	82.6	83.7	95.8	80.4	85.9	82.1	79.5	89.8	80.7	70.6	38.3
1982	80.4	81.2	82.7	100.0	82.0	88.2	82.4	79.4	86.8	80.6	72.0	28.1
1983	80.6	81.4	82.8	99.0	80.6	85.1	81.3	79.6	88.0	81.4	71.7	32.7
1984	81.6	83.2	85.7	92.2	82.9	89.3	77.0	80.4	85.1	82.0	70.8	29.6
1985	83.5	84.8	86.1	92.7	83.5	90.6	81.5	82.7	84.6	84.0	73.9	29.0
1986	84.6	85.4	87.2	92.7	84.2	90.7	80.2	83.5	87.4	85.4	74.9	27.1
1987	84.7	85.0	86.6	92.5	82.6	89.1	81.9	83.5	89.1	86.8	73.5	26.1
1988	85.4	85.5	87.0	92.6	84.7	91.5	81.2	84.6	88.8	86.6	75.9	22.3
1989	88.6	88.7	90.3	93.9	87.3	92.4	85.2	88.2	90.1	89.8	79.5	20.3

Note: Proportion of those who entered graduate courses or went to permanent employment directly after graduation.

Appendix Table C-1

Employed Graduates by Industry - University, All Departments

	Total N. of Graduates	N. of Employed Graduates									% Distribution						
		Primary & Secondary Sector			Tertiary Sector						Total	Primary & Secondary Sector	Trade	Bank/ Insurance	Services/ Transport	Govern- ment	Others
		Total	Manufac- turing	Others	Total	Trade	Bank/ Insurance	Services/ Transport	Govern- ment	Others							
1960	99,706	38,466	32,727	5,739	61,240	14,257	10,305	28,262	5,261	3,155	100.0	38.6	14.3	10.3	28.3	5.3	3.2
1961	104,464	42,033	36,243	5,790	62,431	15,521	12,128	27,272	4,619	2,891	100.0	40.2	14.9	11.6	26.1	4.4	2.8
1962	110,991	48,722	42,033	6,689	62,269	15,424	11,182	27,778	5,390	2,495	100.0	43.9	13.9	10.1	25.0	4.9	2.2
1963	119,331	50,081	42,900	7,181	69,250	17,345	11,076	31,277	6,337	3,215	100.0	42.0	14.5	9.3	26.2	5.3	2.7
1964	127,812	53,400	45,631	7,769	74,412	20,123	11,028	33,448	6,484	3,329	100.0	41.8	15.7	8.6	26.2	5.1	2.6
1965	135,419	57,542	48,831	8,711	77,877	20,868	10,965	35,418	6,775	3,851	100.0	42.5	15.4	8.1	26.2	5.0	2.8
1966	142,386	53,570	44,347	9,223	88,816	24,484	12,287	38,044	9,181	4,820	100.0	37.6	17.2	8.6	26.7	6.4	3.4
1967	150,871	59,795	49,189	10,606	91,076	26,350	11,036	38,281	9,596	5,813	100.0	39.6	17.5	7.3	25.4	6.4	3.9
1968	158,957	63,464	52,612	10,852	95,493	28,921	10,862	39,017	8,803	7,890	100.0	39.9	18.2	6.8	24.5	5.5	5.0
1969	172,125	69,020	57,131	11,889	103,105	33,767	12,263	40,571	8,767	7,737	100.0	40.1	19.6	7.1	23.6	5.1	4.5
1970	188,227	85,656	72,789	12,867	102,579	32,228	16,162	42,083	10,866	1,240	100.0	45.5	17.1	8.6	22.4	5.8	0.7
1971	215,595	97,247	78,576	18,671	118,348	34,082	21,188	47,207	14,711	1,160	100.0	45.1	15.8	9.8	21.9	6.8	0.5
1972	217,308	91,270	68,910	22,360	126,038	35,010	24,174	47,406	16,902	2,546	100.0	42.0	16.1	11.1	21.8	7.8	1.2
1973	223,889	89,564	66,396	23,168	134,325	32,199	27,134	51,465	20,266	3,261	100.0	40.0	14.4	12.1	23.0	9.1	1.5
1974	230,687	87,401	65,115	22,286	143,286	35,537	28,698	51,473	23,566	4,012	100.0	37.9	15.4	12.4	22.3	10.2	1.7
1975	232,683	81,226	62,400	18,826	151,457	40,732	29,259	56,693	22,045	2,728	100.0	34.9	17.5	12.6	24.4	9.5	1.2
1976	230,463	79,718	60,798	18,920	150,745	34,560	33,782	58,402	18,992	5,009	100.0	34.6	15.0	14.7	25.3	8.2	2.2
1977	244,617	86,116	67,883	18,233	158,501	37,089	32,940	60,403	23,883	4,186	100.0	35.2	15.2	13.5	24.7	9.8	1.7
1978	256,817	85,411	66,089	19,322	171,406	37,499	34,149	66,036	30,302	3,420	100.0	33.3	14.6	13.3	25.7	11.8	1.3
1979	275,760	87,275	64,662	22,613	188,485	54,276	24,227	77,912	28,559	3,511	100.0	31.6	19.7	8.8	28.3	10.4	1.3
1980	285,129	91,319	69,308	22,011	193,810	52,325	25,907	82,400	30,702	2,476	100.0	32.0	18.4	9.1	28.9	10.8	0.9
1981	294,078	100,376	79,046	21,330	193,702	50,082	27,839	81,977	31,200	2,604	100.0	34.1	17.0	9.5	27.9	10.6	0.9
1982	293,344	102,988	80,606	22,382	190,356	47,760	28,059	82,741	29,020	2,776	100.0	35.1	16.3	9.6	28.2	9.9	0.9
1983	281,998	96,909	76,745	20,164	185,089	45,748	27,316	81,802	27,745	2,478	100.0	34.4	16.2	9.7	29.0	9.8	0.9
1984	285,443	95,419	76,811	18,608	190,024	46,934	28,138	86,384	26,512	2,056	100.0	33.4	16.4	9.9	30.3	9.3	0.7
1985	288,343	98,924	80,936	17,988	189,419	42,519	27,256	90,213	27,640	1,791	100.0	34.3	14.7	9.5	31.3	9.6	0.6
1986	291,720	99,682	83,027	16,655	192,238	44,251	27,503	91,310	27,630	1,544	100.0	34.1	15.2	9.4	31.3	9.5	0.5
1987	294,852	96,092	78,876	17,216	198,760	46,297	30,279	92,784	27,528	1,872	100.0	32.6	15.7	10.3	31.5	9.3	0.6
1988	298,029	94,579	75,143	19,436	203,446	46,685	35,874	90,494	28,782	1,811	100.0	31.7	15.6	12.0	30.4	9.7	0.6
1989	300,019	99,564	80,222	19,342	200,456	46,388	34,915	91,016	26,337	1,800	100.0	33.2	15.5	11.6	30.3	8.8	0.6
1990	324,220	111,211	90,305	20,906	213,008	46,570	41,196	95,762	27,351	2,129	100.0	34.3	14.4	12.7	29.5	8.4	0.7

Source: From 1960 to 1989, School Fundamental Survey, Various Years.
For 1990, Quick Report of the School Fundamental Survey, 1990.

Appendix Table C-2

Employed Graduates by Industry - University, Males, All Departments

	Total N. of Graduates	N. of Employed Graduates									X Distribution						
		Primary & Secondary Sector			Tertiary Sector						Total	Primary & Secondary Sector	Trade	Bank/ Insurance	Services/ Transport	Govern- ment	Others
		Total	Manufac- turing	Others	Total	Trade	Bank/ Insurance	Services/ Transport	Govern- ment	Others							
1960	89,166	36,746	31,141	5,605	52,420	13,500	10,112	21,094	4,885	2,829	100.0	41.2	15.1	11.3	23.7	5.5	3.2
1961	92,229	40,074	34,411	5,663	52,155	14,574	11,824	19,049	4,225	2,483	100.0	43.5	15.8	12.8	20.7	4.6	2.7
1962	98,120	46,587	40,033	6,554	51,533	14,566	10,872	18,974	4,950	2,171	100.0	47.5	14.8	11.1	19.3	5.0	2.2
1963	104,745	47,759	40,722	7,037	56,986	16,391	10,799	21,159	5,830	2,807	100.0	45.6	15.6	10.3	20.2	5.6	2.7
1964	111,003	50,708	43,113	7,595	60,295	19,049	10,751	21,807	5,969	2,719	100.0	45.7	17.2	9.7	19.6	5.4	2.4
1965	117,891	54,802	46,296	8,506	63,089	19,820	10,763	23,055	6,262	3,189	100.0	46.5	16.8	9.1	19.6	5.3	2.7
1966	123,938	51,231	42,230	9,001	72,707	23,277	12,043	24,563	8,611	4,213	100.0	41.3	18.8	9.7	19.8	6.9	3.4
1967	131,148	56,916	46,571	10,345	74,232	25,028	10,812	24,273	8,982	5,137	100.0	43.4	19.1	8.2	18.5	6.8	3.9
1968	137,653	60,184	49,643	10,541	77,469	27,289	10,569	24,578	8,153	6,880	100.0	43.7	19.8	7.7	17.9	5.9	5.0
1969	147,044	64,769	53,291	11,478	82,275	31,284	11,766	24,492	8,044	6,689	100.0	44.0	21.3	8.0	16.7	5.5	4.5
1970	159,037	78,806	66,662	12,144	80,239	29,381	14,923	25,086	9,891	958	100.0	49.6	18.5	9.4	15.8	6.2	0.6
1971	183,242	89,671	71,821	17,850	93,571	31,129	18,973	29,306	13,289	874	100.0	48.9	17.0	10.4	16.0	7.3	0.5
1972	186,334	84,957	63,542	21,415	101,377	32,390	21,536	29,733	15,562	2,156	100.0	45.6	17.4	11.6	16.0	8.4	1.2
1973	189,385	83,461	61,343	22,118	105,924	29,036	23,797	31,997	18,647	2,447	100.0	44.1	15.3	12.6	16.9	9.8	1.3
1974	192,691	80,126	58,775	21,351	112,565	31,697	25,085	31,059	21,393	3,331	100.0	41.6	16.4	13.0	16.1	11.1	1.7
1975	190,248	74,089	56,467	17,622	116,157	35,598	25,323	33,128	20,045	2,063	100.0	38.9	18.7	13.3	17.4	10.5	1.1
1976	187,774	72,991	55,228	17,763	114,783	30,185	31,033	32,724	16,764	4,077	100.0	38.9	16.1	16.5	17.4	8.9	2.2
1977	196,809	78,626	61,680	16,946	118,183	31,534	30,135	32,155	20,992	3,367	100.0	40.0	16.0	15.3	16.3	10.7	1.7
1978	204,997	77,495	59,645	17,850	127,502	31,049	30,754	35,988	26,882	2,829	100.0	37.8	15.1	15.0	17.6	13.1	1.4
1979	218,101	77,691	56,992	20,699	140,410	46,771	21,577	44,144	25,256	2,662	100.0	35.6	21.4	9.9	20.2	11.6	1.2
1980	223,571	82,137	61,777	20,360	141,434	44,192	23,718	45,359	26,420	1,745	100.0	36.7	19.8	10.6	20.3	11.8	0.8
1981	229,511	89,553	69,871	19,682	139,958	41,944	24,866	45,104	26,255	1,789	100.0	39.0	18.3	10.8	19.7	11.4	0.8
1982	229,315	91,585	70,856	20,729	137,730	39,668	24,876	46,136	24,918	2,132	100.0	39.9	17.3	10.8	20.1	10.9	0.9
1983	219,445	85,799	67,156	18,643	133,666	37,531	23,706	47,241	23,407	1,781	100.0	39.1	17.1	10.8	21.5	10.7	0.8
1984	220,812	83,027	65,993	17,034	137,785	37,899	24,777	50,969	22,513	1,627	100.0	37.6	17.2	11.2	23.1	10.2	0.7
1985	221,453	85,569	69,485	16,084	135,884	34,313	23,247	53,843	23,111	1,370	100.0	38.6	15.5	10.5	24.3	10.4	0.6
1986	222,954	85,363	70,502	14,861	137,591	35,242	23,140	55,201	22,823	1,185	100.0	38.3	15.8	10.4	24.8	10.2	0.5
1987	221,941	82,344	66,771	15,573	139,597	36,564	24,613	54,781	22,267	1,372	100.0	37.1	16.5	11.1	24.7	10.0	0.6
1988	222,587	79,689	62,387	17,302	142,896	36,112	28,091	53,947	23,291	1,455	100.0	35.8	16.2	12.6	24.2	10.5	0.7
1989	221,036	82,746	65,827	16,919	138,290	36,231	26,747	52,665	21,156	1,491	100.0	37.4	16.4	12.1	23.8	9.6	0.7
1990	235,328	91,722	73,367	18,355	143,605	35,392	31,489	53,939	21,123	1,662	100.0	39.0	15.0	13.4	22.9	9.0	0.7

Source: From 1960 to 1989, School Fundamental Survey, Various Years.
For 1990, Quick Report of the School Fundamental Survey, 1990.

Appendix Table C-3

Employed Graduates by Industry - University, Females, All Departments

	Total N. of Graduates	N. of Employed Graduates									% Distribution						
		Primary & Secondary Sector			Tertiary Sector						Total	Primary & Secondary Sector	Trade	Bank/ Insurance	Services/ Transport	Govern- ment	Others
		Total	Manufac- turing	Others	Total	Trade	Bank/ Insurance	Services/ Transport	Govern- ment	Others							
1960	10,540	1,720	1,586	134	8,820	757	193	7,168	376	326	100.0	16.3	7.2	1.8	68.0	3.6	3.1
1961	12,235	1,959	1,832	127	10,276	947	304	8,223	394	408	100.0	16.0	7.7	2.5	67.2	3.2	3.3
1962	12,871	2,135	2,000	135	10,736	858	310	8,804	440	324	100.0	16.6	6.7	2.4	68.4	3.4	2.5
1963	14,586	2,322	2,178	144	12,264	954	277	10,118	507	408	100.0	15.9	6.5	1.9	69.4	3.5	2.8
1964	16,809	2,692	2,518	174	14,117	1,074	277	11,641	515	610	100.0	16.0	6.4	1.6	69.3	3.1	3.6
1965	17,528	2,740	2,535	205	14,788	1,048	202	12,363	513	662	100.0	15.6	6.0	1.2	70.5	2.9	3.8
1966	18,448	2,339	2,117	222	16,109	1,207	244	13,481	570	607	100.0	12.7	6.5	1.3	73.1	3.1	3.3
1967	19,723	2,879	2,618	261	16,844	1,322	224	14,008	614	676	100.0	14.6	6.7	1.1	71.0	3.1	3.4
1968	21,304	3,280	2,969	311	18,024	1,632	293	14,439	650	1,010	100.0	15.4	7.7	1.4	67.8	3.1	4.7
1969	25,081	4,251	3,840	411	20,830	2,483	497	16,079	723	1,048	100.0	16.9	9.9	2.0	64.1	2.9	4.2
1970	29,190	6,850	6,127	723	22,340	2,847	1,239	16,997	975	282	100.0	23.5	9.8	4.2	58.2	3.3	1.0
1971	32,353	7,576	6,755	821	24,777	2,953	2,215	17,901	1,422	286	100.0	23.4	9.1	6.8	55.3	4.4	0.9
1972	30,974	6,313	5,368	945	24,661	2,620	2,638	17,673	1,340	390	100.0	20.4	8.5	8.5	57.1	4.3	1.3
1973	34,504	6,103	5,053	1,050	28,401	3,163	3,337	19,468	1,619	814	100.0	17.7	9.2	9.7	56.4	4.7	2.4
1974	37,996	7,275	6,340	935	30,721	3,840	3,613	20,414	2,173	681	100.0	19.1	10.1	9.5	53.7	5.7	1.8
1975	42,437	7,137	5,933	1,204	35,300	5,134	3,936	23,565	2,000	665	100.0	16.8	12.1	9.3	55.5	4.7	1.6
1976	42,689	6,727	5,570	1,157	35,962	4,375	2,749	25,678	2,228	932	100.0	15.8	10.2	6.4	60.2	5.2	2.2
1977	47,808	7,490	6,203	1,287	40,318	5,555	2,805	28,248	2,891	819	100.0	15.7	11.6	5.9	59.1	6.0	1.7
1978	51,820	7,916	6,444	1,472	43,904	6,450	3,395	30,048	3,420	591	100.0	15.3	12.4	6.6	58.0	6.6	1.1
1979	57,659	9,584	7,670	1,914	48,075	7,505	2,650	33,768	3,303	849	100.0	16.6	13.0	4.6	58.6	5.7	1.5
1980	61,558	9,182	7,531	1,651	52,376	8,133	2,189	37,041	4,282	731	100.0	14.9	13.2	3.6	60.2	7.0	1.2
1981	64,567	10,823	9,175	1,648	53,744	8,138	2,973	36,873	4,945	815	100.0	16.8	12.6	4.6	57.1	7.7	1.3
1982	64,029	11,403	9,750	1,653	52,626	8,092	3,183	36,605	4,102	644	100.0	17.8	12.6	5.0	57.2	6.4	1.0
1983	62,533	11,110	9,589	1,521	51,423	8,217	3,610	34,561	4,338	697	100.0	17.8	13.1	5.8	55.3	6.9	1.1
1984	64,631	12,392	10,818	1,574	52,239	9,035	3,361	35,415	3,999	429	100.0	19.2	14.0	5.2	54.8	6.2	0.7
1985	66,890	13,355	11,451	1,904	53,535	8,206	4,009	36,370	4,529	421	100.0	20.0	12.3	6.0	54.4	6.8	0.6
1986	68,766	14,119	12,525	1,594	54,647	9,009	4,363	36,109	4,807	359	100.0	20.5	13.1	6.3	52.5	7.0	0.5
1987	72,911	13,748	12,105	1,643	59,163	9,733	5,666	38,003	5,261	500	100.0	18.9	13.3	7.8	52.1	7.2	0.7
1988	75,442	14,890	12,756	2,134	60,550	10,373	7,783	36,547	5,491	356	100.0	19.7	13.7	10.3	48.4	7.3	0.5
1989	78,983	16,818	14,395	2,423	62,166	10,157	8,168	38,351	5,181	309	100.0	21.3	12.9	10.3	48.6	6.6	0.4
1990	88,892	19,489	16,938	2,551	69,404	11,178	9,708	41,823	6,228	467	100.0	21.9	12.6	10.9	47.0	7.0	0.5

Source: From 1960 to 1989, School Fundamental Survey, Various Years.
For 1990, Quick Report of the School Fundamental Survey, 1990.

Appendix Table C-4

Employed Graduates by Industry - Junior College, All Departments

	Total N. of Graduates	N. of Employed Graduates									% Distribution						
		Primary & Secondary Sector			Tertiary Sector						Total	Primary & Secondary Sector	Trade	Bank/ Insurance	Services/ Transport	Govern- ment	Others
		Total	Manufac- turing	Others	Total	Trade	Bank/ Insurance	Services Transport	Govern- ment	Others							
1960	17,917	5,503	4,523	980	12,414	2,125	1,118	6,344	1,838	989	100.0	30.7	11.9	6.2	35.4	10.3	5.5
1961	20,553	6,565	5,563	1,002	13,988	2,324	1,561	7,406	1,809	888	100.0	31.9	11.3	7.6	36.0	8.8	4.3
1962	22,951	7,244	6,303	941	15,707	2,587	1,725	8,231	2,012	1,152	100.0	31.6	11.3	7.5	35.9	8.8	5.0
1963	26,542	8,210	7,181	1,029	18,332	2,791	2,229	9,710	2,408	1,194	100.0	30.9	10.5	8.4	36.6	9.1	4.5
1964	32,897	10,501	9,138	1,363	22,396	3,611	3,028	11,791	2,603	1,363	100.0	31.9	11.0	9.2	35.8	7.9	4.1
1965	35,547	10,713	9,250	1,463	24,834	4,201	3,068	13,379	2,779	1,407	100.0	30.1	11.8	8.6	37.6	7.8	4.0
1966	33,919	9,577	8,143	1,434	24,342	3,973	2,565	13,384	3,012	1,408	100.0	28.2	11.7	7.6	39.5	8.9	4.2
1967	45,447	12,767	10,797	1,970	32,680	6,038	3,075	18,257	3,124	2,186	100.0	28.1	13.3	6.8	40.2	6.9	4.8
1968	63,562	18,096	15,288	2,808	45,466	8,615	5,033	25,475	3,579	2,764	100.0	28.5	13.6	7.9	40.1	5.6	4.3
1969	75,579	19,642	16,537	3,105	55,937	10,741	7,240	30,163	3,674	4,119	100.0	26.0	14.2	9.6	39.9	4.9	5.4
1970	80,740	21,986	18,701	3,285	58,754	10,652	11,039	32,916	3,295	852	100.0	27.2	13.2	13.7	40.8	4.1	1.1
1971	82,580	22,509	18,397	4,112	60,071	10,313	12,536	32,095	4,081	1,046	100.0	27.3	12.5	15.2	38.9	4.9	1.3
1972	75,861	18,802	15,290	3,512	57,059	9,854	11,550	30,977	3,528	1,150	100.0	24.8	13.0	15.2	40.8	4.7	1.5
1973	91,704	21,603	17,698	3,905	70,101	12,239	13,700	37,828	5,057	1,277	100.0	23.6	13.3	14.9	41.3	5.5	1.4
1974	98,863	24,317	20,106	4,211	74,546	13,441	15,695	38,517	5,418	1,475	100.0	24.6	13.6	15.9	39.0	5.5	1.5
1975	103,314	24,480	19,870	4,610	78,834	14,253	15,926	42,524	4,633	1,498	100.0	23.7	13.8	15.4	41.2	4.5	1.4
1976	104,168	23,260	18,406	4,854	80,908	13,983	11,989	46,448	5,994	2,494	100.0	22.3	13.4	11.5	44.6	5.8	2.4
1977	114,340	25,150	20,152	4,998	89,190	16,283	13,575	49,349	8,015	1,968	100.0	22.0	14.2	11.9	43.2	7.0	1.7
1978	115,423	23,710	18,349	5,361	91,713	15,760	14,445	51,701	7,930	1,877	100.0	20.5	13.7	12.5	44.8	6.9	1.6
1979	123,442	25,811	20,464	5,347	97,631	18,928	14,241	54,505	8,013	1,944	100.0	20.9	15.3	11.5	44.2	6.5	1.6
1980	129,156	28,870	23,309	5,561	100,286	19,758	17,251	53,175	8,131	1,971	100.0	22.4	15.3	13.4	41.2	6.3	1.5
1981	130,087	29,953	24,442	5,511	100,134	19,252	20,022	51,750	7,465	1,645	100.0	23.0	14.8	15.4	39.8	5.7	1.3
1982	130,100	30,654	25,345	5,309	99,446	18,885	19,947	51,205	7,598	1,811	100.0	23.6	14.5	15.3	39.4	5.8	1.4
1983	131,609	30,513	24,874	5,639	101,096	18,660	20,270	52,696	8,063	1,407	100.0	23.2	14.2	15.4	40.0	6.1	1.1
1984	134,463	31,529	26,426	5,103	102,934	19,350	22,701	52,208	7,191	1,484	100.0	23.4	14.4	16.9	38.8	5.3	1.1
1985	140,870	35,925	30,067	5,858	104,945	19,776	22,350	54,645	7,025	1,149	100.0	25.5	14.0	15.9	38.8	5.0	0.8
1986	139,639	31,015	25,536	5,479	108,624	23,038	20,884	56,972	6,604	1,126	100.0	22.2	16.5	15.0	40.8	4.7	0.8
1987	133,221	26,493	21,464	5,029	106,728	22,014	23,623	53,918	6,091	1,082	100.0	19.9	16.5	17.7	40.5	4.6	0.8
1988	160,881	32,501	26,145	6,356	128,380	29,051	27,726	63,849	6,592	1,162	100.0	20.2	18.1	17.2	39.7	4.1	0.7
1989	174,460	40,493	33,455	7,038	133,966	31,169	30,417	65,061	6,063	1,256	100.0	23.2	17.9	17.4	37.3	3.5	0.7
1990	181,230	42,273	34,955	7,318	138,958	31,560	34,693	65,435	6,017	1,253	100.0	23.3	17.4	19.1	36.1	3.3	0.7

Source: From 1960 to 1989, School Fundamental Survey, Various Years.
For 1990, Quick Report of the School Fundamental Survey, 1990.

Appendix Table C-5

Employed Graduates by Industry - University, Humanities

	Total N. of Graduates	N. of Employed Graduates									% Distribution						
		Primary & Secondary Sector			Tertiary Sector						Total	Primary & Secondary Sector	Trade	Bank/ Insurance	Services/ Transport	Govern- ment	Others
		Total	Manufac- turing	Others	Total	Trade	Bank/ Insurance	Services/ Transport	Govern- ment	Others							
1960	13,318	3,033	2,834	199	10,285	2,226	842	5,856	758	603	100.0	22.8	16.7	6.3	44.0	5.7	4.5
1961	13,426	3,272	3,097	175	10,154	2,610	1,054	5,197	660	633	100.0	24.4	19.4	7.9	38.7	4.9	4.7
1962	13,570	3,489	3,277	212	10,081	2,623	953	5,381	724	400	100.0	25.7	19.3	7.0	39.7	5.3	2.9
1963	14,610	3,519	3,332	187	11,091	2,544	828	6,442	808	469	100.0	24.1	17.4	5.7	44.1	5.5	3.2
1964	16,497	3,905	3,678	227	12,592	2,867	794	7,621	808	502	100.0	23.7	17.4	4.8	46.2	4.9	3.0
1965	16,667	3,913	3,669	244	12,754	2,672	625	7,982	794	681	100.0	23.5	16.0	3.7	47.9	4.8	4.1
1966	16,040	3,323	3,068	255	12,717	2,980	725	7,246	1,008	758	100.0	20.7	18.6	4.5	45.2	6.3	4.7
1967	17,392	3,947	3,658	289	13,445	3,190	730	7,551	1,004	970	100.0	22.7	18.3	4.2	43.4	5.8	5.6
1968	14,470	3,391	3,126	265	11,079	2,769	539	5,922	639	1,210	100.0	23.4	19.1	3.7	40.9	4.4	8.4
1969	15,465	3,711	3,425	286	11,754	3,281	651	6,364	565	893	100.0	24.0	21.2	4.2	41.2	3.7	5.8
1970	18,414	5,520	5,047	473	12,894	3,959	1,398	6,705	604	228	100.0	30.0	21.5	7.6	36.4	3.3	1.2
1971	20,841	6,048	5,474	574	14,793	4,115	1,789	7,526	1,180	183	100.0	29.0	19.7	8.6	36.1	5.7	0.9
1972	20,618	5,504	4,724	780	15,114	3,771	2,381	7,516	1,224	222	100.0	26.7	18.3	11.5	36.5	5.9	1.1
1973	21,927	4,961	4,206	755	16,966	4,134	2,514	8,304	1,625	389	100.0	22.6	18.9	11.5	37.9	7.4	1.8
1974	23,035	5,116	4,528	588	17,919	4,646	3,028	8,021	1,817	407	100.0	22.2	20.2	13.1	34.8	7.9	1.8
1975	23,843	4,793	4,163	630	19,050	5,077	3,381	8,380	1,916	296	100.0	20.1	21.3	14.2	35.1	8.0	1.2
1976	23,263	4,617	3,995	622	18,646	3,898	2,253	10,705	1,340	450	100.0	19.8	16.8	9.7	46.0	5.8	1.9
1977	25,810	5,135	4,382	753	20,675	4,923	2,284	11,380	1,682	406	100.0	19.9	19.1	8.8	44.1	6.5	1.6
1978	27,831	5,651	4,787	864	22,180	5,005	2,554	12,090	2,354	177	100.0	20.3	18.0	9.2	43.4	8.5	0.6
1979	30,921	6,685	5,360	1,325	24,236	6,632	2,011	12,960	2,269	364	100.0	21.6	21.4	6.5	41.9	7.3	1.2
1980	33,231	5,934	4,917	1,017	27,297	6,360	1,555	16,083	2,972	327	100.0	17.9	19.1	4.7	48.4	8.9	1.0
1981	35,157	6,569	5,597	972	28,588	6,689	2,067	16,168	3,400	464	100.0	18.7	18.5	5.9	46.0	9.7	1.3
1982	36,093	6,835	5,882	953	29,258	6,673	2,401	16,925	2,934	325	100.0	18.9	18.5	6.7	46.9	8.1	0.9
1983	35,847	6,712	5,845	867	29,135	6,673	2,651	16,320	3,105	386	100.0	18.7	18.6	7.4	45.5	8.7	1.1
1984	38,199	7,391	6,448	943	30,808	7,416	2,573	17,863	2,844	112	100.0	19.3	19.4	6.7	46.8	7.4	0.3
1985	38,866	8,097	6,867	1,230	30,769	6,708	2,797	18,313	2,751	200	100.0	20.8	17.3	7.2	47.1	7.1	0.5
1986	39,806	7,784	6,906	878	32,022	7,402	2,842	18,842	2,796	140	100.0	19.6	18.6	7.1	47.3	7.0	0.4
1987	40,754	7,565	6,512	1,053	33,189	7,878	3,408	18,392	3,179	332	100.0	18.6	19.3	8.4	45.1	7.8	0.8
1988	41,837	8,057	6,847	1,210	33,779	8,332	4,837	17,427	3,029	154	100.0	19.3	19.9	11.6	41.7	7.2	0.4
1989	43,521	9,068	7,739	1,329	34,453	8,418	4,803	18,141	3,022	69	100.0	20.8	19.3	11.0	41.7	6.9	0.2
1990	47,952	9,875	8,570	1,305	38,075	8,580	5,896	19,782	3,460	357	100.0	20.6	17.9	12.3	41.3	7.2	0.7

Source: From 1960 to 1989, School Fundamental Survey, Various Years.
For 1990, Quick Report of the School Fundamental Survey, 1990.

Appendix Table C-6

Employed Graduates by Industry - University, Social Sciences

	Total N. of Graduates	N. of Employed Graduates									% Distribution						
		Primary & Secondary Sector			Tertiary Sector						Total	Primary & Secondary Sector	Trade	Bank/ Insurance	Services/ Transport	Govern- ment	Others
		Total	Manufac- turing	Others	Total	Trade	Bank/ Insurance	Services/ Transport	Govern- ment	Others							
1960	44,843	16,240	14,567	1,673	28,603	10,647	9,102	4,524	2,634	1,696	100.0	36.2	23.7	20.3	10.1	5.9	3.8
1961	46,858	17,396	15,701	1,695	29,462	11,212	10,705	3,977	2,231	1,337	100.0	37.1	23.9	22.8	8.5	4.8	2.9
1962	49,960	20,671	18,627	2,044	29,289	11,188	9,897	4,523	2,609	1,072	100.0	41.4	22.4	19.8	9.1	5.2	2.1
1963	54,049	21,094	18,778	2,316	32,955	13,124	9,840	5,312	3,156	1,523	100.0	39.0	24.3	18.2	9.8	5.8	2.8
1964	57,102	21,420	19,255	2,165	35,682	15,328	9,852	5,817	3,210	1,475	100.0	37.5	26.8	17.3	10.2	5.6	2.6
1965	62,338	23,469	20,896	2,573	38,869	16,283	9,927	7,185	3,550	1,924	100.0	37.6	26.1	15.9	11.5	5.7	3.1
1966	66,059	19,758	17,049	2,709	46,301	19,003	11,231	8,482	4,960	2,625	100.0	29.9	28.8	17.0	12.8	7.5	4.0
1967	69,616	22,455	19,505	2,950	47,161	20,228	9,936	8,228	5,391	3,378	100.0	32.3	29.1	14.3	11.8	7.7	4.9
1968	77,298	24,806	22,046	2,760	52,492	22,661	9,725	10,034	5,539	4,533	100.0	32.1	29.3	12.6	13.0	7.2	5.9
1969	83,063	26,372	23,476	2,896	56,691	26,047	10,935	10,511	5,297	3,901	100.0	31.7	31.4	13.2	12.7	6.4	4.7
1970	89,045	32,556	29,025	3,531	56,489	24,154	13,875	11,672	6,435	353	100.0	36.6	27.1	15.6	13.1	7.2	0.4
1971	100,593	35,572	30,541	5,031	65,021	25,241	18,179	12,753	8,537	311	100.0	35.4	25.1	18.1	12.7	8.5	0.3
1972	101,809	32,290	26,341	5,949	69,519	26,044	20,262	13,160	9,223	830	100.0	31.7	25.6	19.9	12.9	9.1	0.8
1973	104,141	31,940	25,459	6,481	72,201	22,805	22,927	13,091	12,150	1,228	100.0	30.7	21.9	22.0	12.6	11.7	1.2
1974	105,875	28,376	23,060	5,316	77,499	24,741	23,695	12,969	14,548	1,546	100.0	26.8	23.4	22.4	12.2	13.7	1.5
1975	106,680	25,590	21,821	3,769	81,090	28,221	23,675	14,371	13,908	915	100.0	24.0	26.5	22.2	13.5	13.0	0.9
1976	106,358	25,387	20,964	4,423	80,971	23,067	29,484	12,946	13,167	2,307	100.0	23.9	21.7	27.7	12.2	12.4	2.2
1977	110,926	28,141	24,407	3,734	82,785	23,613	28,488	12,852	16,211	1,621	100.0	25.4	21.3	25.7	11.6	14.6	1.5
1978	116,179	26,263	22,461	3,802	89,916	23,950	29,575	14,701	20,268	1,422	100.0	22.6	20.6	25.5	12.7	17.4	1.2
1979	123,673	27,950	22,836	5,114	95,723	36,937	20,663	19,397	17,598	1,128	100.0	22.6	29.9	16.7	15.7	14.2	0.9
1980	127,902	28,963	23,768	5,195	98,939	36,428	23,077	19,478	19,055	901	100.0	22.6	28.5	18.0	15.2	14.9	0.7
1981	131,543	32,523	27,775	4,748	99,020	35,432	24,240	18,637	19,687	1,024	100.0	24.7	26.9	18.4	14.2	15.0	0.8
1982	132,306	33,283	27,660	5,623	99,023	33,975	24,311	20,010	19,093	1,634	100.0	25.2	25.7	18.4	15.1	14.4	1.2
1983	126,557	30,472	25,711	4,761	96,085	32,498	23,226	21,442	17,823	1,096	100.0	24.1	25.7	18.4	16.9	14.1	0.9
1984	127,555	29,928	25,634	4,294	97,627	32,087	23,799	23,569	17,049	1,123	100.0	23.5	25.2	18.7	18.5	13.4	0.9
1985	127,602	30,543	26,279	4,264	97,059	29,937	22,700	25,851	17,762	809	100.0	23.9	23.5	17.8	20.3	13.9	0.6
1986	128,683	31,015	27,283	3,732	97,668	30,368	22,676	26,179	17,778	667	100.0	24.1	23.6	17.6	20.3	13.8	0.5
1987	127,315	27,403	23,148	4,255	99,912	31,306	24,206	26,478	17,101	821	100.0	21.5	24.6	19.0	20.8	13.4	0.6
1988	128,673	27,360	22,168	5,192	101,314	30,065	27,091	25,626	17,575	957	100.0	21.3	23.4	21.1	19.9	13.7	0.7
1989	127,986	29,847	24,657	5,190	98,139	30,198	25,778	25,312	15,681	1,170	100.0	23.3	23.6	20.1	19.8	12.3	0.9
1990	138,177	34,426	28,104	6,322	103,750	29,840	29,738	27,601	15,866	905	100.0	24.9	21.6	21.5	20.0	11.3	0.7

Source: From 1960 to 1989, School Fundamental Survey, Various Years.
For 1990, Quick Report of the School Fundamental Survey, 1990.

Appendix Table C-7

Employed Graduates by Industry - University, Natural Sciences

	Total No. of Graduates	No. of Employed Graduates								% Distribution						
		Primary & Secondary Sector			Tertiary Sector					Total	Primary & Secondary Sector	Trade	Bank/ Insurance	Services/ Transport	Govern- ment	Others
		Total	Manufac- turing	Others	Total	Trade	Bank/ Insurance	Services/ Transport	Govern- ment	Others							
1960	2,654	1,568	1,496	72	1,086	75	44	746	142	79	100.0	59.1	2.8	1.7	28.1	5.4	3.0
1961	2,807	1,859	1,779	80	948	104	46	628	110	60	100.0	66.2	3.7	1.6	22.4	3.9	2.1
1962	2,827	1,925	1,827	98	902	87	34	608	131	42	100.0	68.1	3.1	1.2	21.5	4.6	1.5
1963	3,113	1,801	1,726	75	1,312	71	70	967	125	79	100.0	57.9	2.3	2.2	31.1	4.0	2.5
1964	3,255	1,736	1,660	76	1,519	108	67	1,117	135	92	100.0	53.3	3.3	2.1	34.3	4.1	2.8
1965	3,522	1,903	1,806	97	1,619	115	81	1,214	129	80	100.0	54.0	3.3	2.3	34.5	3.7	2.3
1966	3,831	1,703	1,605	98	2,128	164	68	1,657	148	91	100.0	44.5	4.3	1.8	43.3	3.9	2.4
1967	3,894	1,825	1,728	97	2,069	167	42	1,617	127	116	100.0	46.9	4.3	1.1	41.5	3.3	3.0
1968	4,337	2,177	2,067	110	2,160	297	79	1,379	147	258	100.0	50.2	6.8	1.8	31.8	3.4	5.9
1969	4,887	2,605	2,448	157	2,282	353	135	1,439	155	200	100.0	53.3	7.2	2.8	29.4	3.2	4.1
1970	5,016	3,095	2,924	171	1,921	307	126	1,243	183	62	100.0	61.7	6.1	2.5	24.8	3.6	1.2
1971	5,850	3,698	3,494	204	2,152	335	172	1,358	252	35	100.0	63.2	5.7	2.9	23.2	4.3	0.6
1972	5,885	3,122	2,915	207	2,763	347	260	1,587	404	165	100.0	53.1	5.9	4.4	27.0	6.9	2.8
1973	5,793	2,687	2,427	260	3,106	418	227	1,856	387	218	100.0	46.4	7.2	3.9	32.0	6.7	3.8
1974	6,413	2,987	2,757	230	3,426	424	338	2,102	473	89	100.0	46.6	6.6	5.3	32.8	7.4	1.4
1975	6,408	2,506	2,346	160	3,902	537	359	2,435	465	106	100.0	39.1	8.4	5.6	38.0	7.3	1.7
1976	6,147	2,031	1,836	195	4,116	658	334	2,567	376	181	100.0	33.0	10.7	5.4	41.8	6.1	2.9
1977	6,477	2,160	2,020	140	4,317	699	312	2,765	372	189	100.0	33.3	10.8	4.8	42.6	5.7	2.9
1978	6,762	2,057	1,839	218	4,705	695	279	3,057	541	133	100.0	30.4	10.3	4.1	45.2	8.0	2.0
1979	6,971	2,311	2,120	191	4,660	510	204	3,073	655	218	100.0	33.2	7.3	2.9	44.1	9.4	3.1
1980	7,590	2,413	2,165	248	5,177	586	182	3,645	623	141	100.0	31.8	7.7	2.4	48.0	8.2	1.9
1981	7,838	2,873	2,563	310	4,965	539	172	3,434	668	152	100.0	36.7	6.9	2.2	43.8	8.5	1.9
1982	7,677	3,267	2,997	270	4,410	514	156	3,292	334	114	100.0	42.6	6.7	2.0	42.9	4.4	1.5
1983	7,847	3,292	3,056	236	4,555	307	151	3,481	422	194	100.0	42.0	3.9	1.9	44.4	5.4	2.5
1984	8,304	3,078	2,903	175	5,226	497	208	3,959	468	94	100.0	37.1	6.0	2.5	47.7	5.6	1.1
1985	8,766	3,578	3,440	138	5,188	271	179	4,218	448	72	100.0	40.8	3.1	2.0	48.1	5.1	0.8
1986	8,851	3,698	3,557	141	5,153	296	240	4,071	446	100	100.0	41.8	3.3	2.7	46.0	5.0	1.1
1987	9,261	3,780	3,610	170	5,481	346	256	4,467	321	91	100.0	40.8	3.7	2.8	48.2	3.5	1.0
1988	9,259	3,344	3,083	261	5,914	338	393	4,688	377	118	100.0	36.1	3.7	4.2	50.6	4.1	1.3
1989	9,269	3,995	3,831	164	5,273	364	509	3,842	505	53	100.0	43.1	3.9	5.5	41.6	5.6	0.6
1990	9,252	4,217	4,022	195	5,036	326	600	3,455	397	258	100.0	45.6	3.5	6.5	37.3	4.3	2.8

Source: From 1960 to 1989, School Fundamental Survey, Various Years.
For 1990, Quick Report of the School Fundamental Survey, 1990.

Appendix Table C-8

Employed Graduates by Industry - University, Engineering

	Total N. of Graduates	N. of Employed Graduates								% Distribution						
		Primary & Secondary Sector			Tertiary Sector					Total	Primary & Secondary Sector	Trade	Bank/ Insurance	Services/ Transport	Govern- ment	Others
		Total	Manufac- turing	Others	Total	Trade	Bank/ Insurance	Services/ Transport	Govern- ment	Others							
1960	15,462	13,471	10,477	2,996	1,991	529	103	771	384	204	100.0	87.1	3.4	0.7	5.0	2.5	1.3
1961	16,864	14,585	11,488	3,097	2,279	591	95	768	543	282	100.0	86.5	3.5	0.6	4.6	3.2	1.7
1962	19,605	17,244	13,780	3,464	2,361	584	94	839	629	215	100.0	88.0	3.0	0.5	4.3	3.2	1.1
1963	21,587	18,406	14,606	3,800	3,181	606	111	1,304	863	297	100.0	85.3	2.8	0.5	6.0	4.0	1.4
1964	24,466	20,802	16,303	4,499	3,664	931	119	1,389	920	305	100.0	85.0	3.8	0.5	5.7	3.8	1.2
1965	26,698	22,646	17,656	4,990	4,052	854	135	1,705	994	364	100.0	84.8	3.2	0.5	6.4	3.7	1.4
1966	29,221	23,449	18,319	5,130	5,772	1,179	109	2,309	1,637	538	100.0	80.2	4.0	0.4	7.9	5.6	1.8
1967	32,372	25,824	19,952	5,872	6,548	1,482	156	2,527	1,605	778	100.0	79.8	4.6	0.5	7.8	5.0	2.4
1968	33,649	27,222	20,759	6,463	6,427	1,722	273	2,359	1,097	976	100.0	80.9	5.1	0.8	7.0	3.3	2.9
1969	37,444	30,105	22,906	7,199	7,339	2,170	287	2,229	1,163	1,490	100.0	80.4	5.8	0.8	6.0	3.1	4.0
1970	41,983	36,231	28,782	7,449	5,752	1,911	316	1,835	1,414	276	100.0	86.3	4.6	0.8	4.4	3.4	0.7
1971	49,759	42,054	31,104	10,950	7,705	1,797	408	3,082	2,032	386	100.0	84.5	3.6	0.8	6.2	4.1	0.8
1972	51,134	41,257	27,773	13,484	9,877	2,539	516	2,955	2,990	877	100.0	80.7	5.0	1.0	5.8	5.8	1.7
1973	52,995	41,782	27,875	13,907	11,213	2,584	675	4,165	3,097	692	100.0	78.8	4.9	1.3	7.9	5.8	1.3
1974	53,945	41,708	27,547	14,161	12,237	3,068	633	4,061	3,363	1,112	100.0	77.3	5.7	1.2	7.5	6.2	2.1
1975	54,234	40,320	27,848	12,472	13,914	4,210	861	4,795	3,266	782	100.0	74.3	7.8	1.6	8.8	6.0	1.4
1976	53,320	39,555	27,834	11,721	13,765	3,824	865	5,352	2,280	1,444	100.0	74.2	7.2	1.6	10.0	4.3	2.7
1977	56,657	41,654	30,295	11,359	15,003	3,993	980	5,356	3,348	1,326	100.0	73.5	7.0	1.7	9.5	5.9	2.3
1978	58,615	42,792	30,528	12,264	15,823	3,841	854	6,012	4,042	1,074	100.0	73.0	6.6	1.5	10.3	6.9	1.8
1979	62,421	41,605	27,828	13,777	20,816	6,798	814	7,262	4,862	1,080	100.0	66.7	10.9	1.3	11.6	7.8	1.7
1980	62,131	44,659	31,473	13,186	17,472	5,322	558	6,843	4,207	542	100.0	71.9	8.6	0.9	11.0	6.8	0.9
1981	63,639	48,292	35,254	13,038	15,347	3,745	572	7,005	3,589	436	100.0	75.9	5.9	0.9	11.0	5.6	0.7
1982	62,381	49,091	35,717	13,374	13,290	2,925	475	6,603	2,955	332	100.0	78.7	4.7	0.8	10.6	4.7	0.5
1983	58,220	45,555	33,477	12,078	12,665	2,752	473	6,205	2,822	413	100.0	78.2	4.7	0.8	10.7	4.8	0.7
1984	58,394	44,185	33,176	11,009	14,209	2,888	656	7,780	2,552	333	100.0	75.7	4.9	1.1	13.3	4.4	0.6
1985	59,216	45,743	35,373	10,370	13,473	2,058	670	7,627	2,762	356	100.0	77.2	3.5	1.1	12.9	4.7	0.6
1986	60,279	45,918	35,916	10,002	14,361	2,108	613	9,009	2,283	348	100.0	76.2	3.5	1.0	14.9	3.8	0.6
1987	61,883	46,367	36,197	10,170	15,516	2,269	870	9,662	2,369	346	100.0	74.9	3.7	1.4	15.6	3.8	0.6
1988	61,822	43,642	32,829	10,813	18,179	2,820	1,446	10,906	2,778	229	100.0	70.6	4.6	2.3	17.6	4.5	0.4
1989	61,256	43,768	33,077	10,691	17,489	2,455	1,326	10,691	2,799	218	100.0	71.5	4.0	2.2	17.5	4.6	0.4
1990	65,016	47,395	36,535	10,860	17,620	2,330	1,797	10,248	2,910	335	100.0	72.9	3.6	2.8	15.8	4.5	0.5

Source: From 1960 to 1989, School Fundamental Survey, Various Years.
For 1990, Quick Report of the School Fundamental Survey, 1990.

Appendix Table C-9

Employed Graduates by Industry - University, Health-Related

	Total N. of Graduates	N. of Employed Graduates									% Distribution						
		Primary & Secondary Sector			Tertiary Sector						Total	Primary & Secondary Sector	Tertiary Sector				
		Total	Manufacturing	Others	Total	Trade	Bank/ Insurance	Services/ Transport	Government	Others			Trade	Bank/ Insurance	Services/ Transport	Government	Others
1960	2,928	968	964	4	1,960	325	0	1,520	84	31	100.0	33.1	11.1	0.0	51.9	2.9	1.1
1961	3,157	1,164	1,158	6	1,993	411	0	1,474	56	52	100.0	36.9	13.0	0.0	46.7	1.8	1.6
1962	3,182	1,191	1,183	8	1,991	232	1	1,666	62	30	100.0	37.4	7.3	0.0	52.6	1.9	0.9
1963	3,388	1,402	1,401	1	1,986	270	8	1,500	90	118	100.0	41.4	8.0	0.2	44.3	2.7	3.5
1964	3,624	1,478	1,476	2	2,146	302	5	1,750	48	41	100.0	40.8	8.3	0.1	48.3	1.3	1.1
1965	3,532	1,422	1,420	2	2,110	287	11	1,689	64	59	100.0	40.3	8.1	0.3	47.8	1.8	1.7
1966	3,736	1,185	1,183	2	2,551	344	1	2,099	59	48	100.0	31.7	9.2	0.0	56.2	1.6	1.3
1967	3,878	1,138	1,137	1	2,740	375	5	2,247	86	27	100.0	29.3	9.7	0.1	57.9	2.2	0.7
1968	4,423	1,255	1,253	2	3,168	460	4	2,573	78	53	100.0	28.4	10.4	0.1	58.2	1.8	1.2
1969	4,833	1,336	1,335	1	3,497	438	4	2,861	138	56	100.0	27.6	9.1	0.1	59.2	2.9	1.2
1970	5,420	2,196	2,196	0	3,224	319	2	2,657	230	16	100.0	40.5	5.9	0.0	49.0	4.2	0.3
1971	6,192	2,367	2,350	17	3,825	586	10	2,847	363	19	100.0	38.2	9.5	0.2	46.0	5.9	0.3
1972	5,941	2,003	1,981	22	3,938	547	6	3,053	305	27	100.0	33.7	9.2	0.1	51.4	5.1	0.5
1973	6,381	1,604	1,584	20	4,777	486	24	3,711	420	136	100.0	25.1	7.6	0.4	58.2	6.6	2.1
1974	6,263	1,945	1,936	9	4,318	425	13	3,357	399	124	100.0	31.1	6.8	0.2	53.6	6.4	2.0
1975	6,310	1,615	1,606	9	4,695	376	16	3,998	245	60	100.0	25.6	6.0	0.3	63.4	3.9	1.0
1976	6,492	1,368	1,364	4	5,124	375	8	4,488	151	102	100.0	21.1	5.8	0.1	69.1	2.3	1.6
1977	6,825	1,426	1,424	2	5,399	528	13	4,587	194	77	100.0	20.9	7.7	0.2	67.2	2.8	1.1
1978	7,332	1,471	1,465	6	5,861	552	22	4,917	223	147	100.0	20.1	7.5	0.3	67.1	3.0	2.0
1979	7,969	1,348	1,348	0	6,621	590	11	5,792	203	25	100.0	16.9	7.4	0.1	72.7	2.5	0.3
1980	8,362	1,845	1,845	0	6,517	571	0	5,605	256	85	100.0	22.1	6.8	0.0	67.0	3.1	1.0
1981	8,837	2,050	2,037	13	6,787	620	29	5,975	114	49	100.0	23.2	7.0	0.3	67.6	1.3	0.6
1982	8,936	2,364	2,359	5	6,572	660	5	5,538	305	64	100.0	26.5	7.4	0.1	62.0	3.4	0.7
1983	8,958	2,300	2,300	0	6,658	617	6	5,769	231	35	100.0	25.7	6.9	0.1	64.4	2.6	0.4
1984	8,555	2,301	2,286	15	6,254	665	0	5,348	187	54	100.0	26.9	7.8	0.0	62.5	2.2	0.6
1985	8,692	2,287	2,248	39	6,405	742	0	5,433	200	30	100.0	26.3	8.5	0.0	62.5	2.3	0.3
1986	8,421	2,229	2,229	0	6,192	672	26	5,242	215	37	100.0	26.5	8.0	0.3	62.2	2.6	0.4
1987	9,022	2,328	2,323	5	6,694	925	33	5,403	275	58	100.0	25.8	10.3	0.4	59.9	3.0	0.6
1988	9,231	2,879	2,858	21	6,353	866	11	5,065	337	74	100.0	31.2	9.4	0.1	54.9	3.7	0.8
1989	9,039	2,838	2,805	33	6,203	843	32	5,019	245	64	100.0	31.4	9.3	0.4	55.5	2.7	0.7
1990	9,802	3,555	3,537	18	6,247	742	73	5,155	259	18	100.0	36.3	7.6	0.7	52.6	2.6	0.2

Source: From 1960 to 1989, School Fundamental Survey, Various Years.
For 1990, Quick Report of the School Fundamental Survey, 1990.

Appendix Table C-10
Employed Graduates by Industry - University, Education

	Total No. of Graduates	No. of Employed Graduates									% Distribution						
		Primary & Secondary Sector			Tertiary Sector						Total	Primary & Secondary Sector	Trade	Bank/ Insurance	Services/ Transport	Govern- ment	Others
		Total	Manufac- turing	Others	Total	Trade	Bank/ Insurance	Services/ Transport	Govern- ment	Others							
1960	12,696	235	214	21	12,461	70	59	12,113	171	48	100.0	1.9	0.6	0.5	95.4	1.3	0.4
1961	13,132	283	263	20	12,849	91	67	12,495	132	64	100.0	2.2	0.7	0.5	95.1	1.0	0.5
1962	12,989	360	329	31	12,629	92	81	12,140	222	94	100.0	2.8	0.7	0.6	93.5	1.7	0.7
1963	13,324	288	271	17	13,036	64	59	12,626	153	134	100.0	2.2	0.5	0.4	94.8	1.1	1.0
1964	13,071	331	312	19	12,740	73	43	12,370	155	99	100.0	2.5	0.6	0.3	94.6	1.2	0.8
1965	12,664	312	285	27	12,352	101	46	11,977	114	114	100.0	2.5	0.8	0.4	94.6	0.9	0.9
1966	12,693	234	216	18	12,459	79	26	11,978	133	243	100.0	1.8	0.6	0.2	94.4	1.0	1.9
1967	12,830	313	292	21	12,517	133	40	11,999	193	152	100.0	2.4	1.0	0.3	93.5	1.5	1.2
1968	13,637	469	430	39	13,168	262	68	12,364	238	236	100.0	3.4	1.9	0.5	90.7	1.7	1.7
1969	14,526	653	589	64	13,873	428	111	12,668	335	331	100.0	4.5	2.9	0.8	87.2	2.3	2.3
1970	15,575	831	743	88	14,744	503	188	13,519	454	80	100.0	5.3	3.2	1.2	86.8	2.9	0.5
1971	16,420	1,013	932	81	15,407	459	147	14,156	559	86	100.0	6.2	2.8	0.9	86.2	3.4	0.5
1972	15,887	906	739	167	14,981	454	260	13,522	634	111	100.0	5.7	2.9	1.6	85.1	4.0	0.7
1973	16,554	769	642	127	15,785	440	259	14,172	623	291	100.0	4.6	2.7	1.6	85.6	3.8	1.8
1974	17,693	1,065	888	177	16,628	468	319	14,873	786	182	100.0	6.0	2.6	1.8	84.1	4.4	1.0
1975	18,718	778	627	151	17,940	621	359	16,228	615	117	100.0	4.2	3.3	1.9	86.7	3.3	0.6
1976	18,355	985	794	191	17,370	855	378	15,279	679	179	100.0	5.4	4.7	2.1	83.2	3.7	1.0
1977	19,331	1,100	937	163	18,231	806	316	16,115	738	256	100.0	5.7	4.2	1.6	83.4	3.8	1.3
1978	21,008	1,125	875	250	19,883	969	390	17,209	1,072	243	100.0	5.4	4.6	1.9	81.9	5.1	1.2
1979	22,768	530	413	117	22,238	669	187	20,513	584	285	100.0	2.3	2.9	0.8	90.1	2.6	1.3
1980	23,158	539	467	72	22,619	440	139	21,406	557	77	100.0	2.3	1.9	0.6	92.4	2.4	0.3
1981	23,128	588	509	79	22,540	522	178	21,193	591	56	100.0	2.5	2.3	0.8	91.6	2.6	0.2
1982	22,824	704	618	86	22,120	511	144	20,768	585	112	100.0	3.1	2.2	0.6	91.0	2.6	0.5
1983	21,894	787	709	78	21,107	599	203	19,375	849	81	100.0	3.6	2.7	0.9	88.5	3.9	0.4
1984	21,594	1,036	923	113	20,558	739	289	18,591	884	55	100.0	4.8	3.4	1.3	86.1	4.1	0.3
1985	22,142	1,053	921	132	21,089	648	311	19,122	940	68	100.0	4.8	2.9	1.4	86.4	4.2	0.3
1986	22,199	1,185	1,024	161	21,014	889	352	18,375	1,255	143	100.0	5.3	4.0	1.6	82.8	5.7	0.6
1987	22,342	1,248	1,118	130	21,094	848	495	18,373	1,274	104	100.0	5.6	3.8	2.2	82.2	5.7	0.5
1988	22,159	1,376	1,157	219	20,784	1,074	767	17,310	1,536	97	100.0	6.2	4.8	3.5	78.1	6.9	0.4
1989	23,837	1,762	1,505	257	22,075	1,079	942	18,827	1,150	77	100.0	7.4	4.5	4.0	79.0	4.8	0.3
1990	25,457	2,267	1,889	378	23,191	1,357	1,188	19,058	1,491	97	100.0	8.9	5.3	4.7	74.9	5.9	0.4

Source: From 1960 to 1989, School Fundamental Survey, Various Years.
For 1990, Quick Report of the School Fundamental Survey, 1990.

Appendix Table C-11

Changes in Industrial Distribution of Employed New Graduates from Universities

	Total N. of Graduates	N. of Employed Graduates						% Distribution						
		Primary & Secondary Sector	Tertiary Sector					Total	Primary & Secondary Sector	Tertiary Sector				
			Services/ Transport	Trade	Bank/ Insurance	Govern- ment	Others			Services/ Transport	Trade	Bank/ Insurance	Govern- ment	Others
Humanities														
1960	13,318	3,033	5,856	2,226	842	758	603	100.0	22.8	44.0	16.7	6.3	5.7	4.5
1970	18,414	5,520	6,705	3,959	1,398	604	228	100.0	30.0	36.4	21.5	7.6	3.3	1.2
1980	33,231	5,934	16,083	6,360	1,555	2,972	327	100.0	17.9	48.4	19.1	4.7	8.9	1.0
1990	47,952	9,875	19,782	8,580	5,896	3,460	357	100.0	20.6	41.3	17.9	12.3	7.2	0.7
Social Sciences														
1960	44,843	16,240	4,524	10,647	9,102	2,634	1,696	100.0	36.2	10.1	23.7	20.3	5.9	3.8
1970	89,045	32,556	11,672	24,154	13,875	6,435	353	100.0	36.6	13.1	27.1	15.6	7.2	0.4
1980	127,902	28,963	19,478	36,428	23,077	19,055	901	100.0	22.6	15.2	28.5	18.0	14.9	0.7
1990	138,177	34,426	27,601	29,840	29,738	15,666	905	100.0	24.9	20.0	21.6	21.5	11.3	0.7
Natural Sciences														
1960	2,654	1,568	746	75	44	142	79	100.0	59.1	28.1	2.8	1.7	5.4	3.0
1970	5,016	3,095	1,243	307	126	183	62	100.0	61.7	24.8	6.1	2.5	3.6	1.2
1980	7,590	2,413	3,645	586	182	623	141	100.0	31.8	48.0	7.7	2.4	8.2	1.9
1990	9,252	4,217	3,455	326	600	397	258	100.0	45.6	37.3	3.5	6.5	4.3	2.8
Engineering														
1960	15,462	13,471	771	529	103	382	204	100.0	87.1	5.0	3.4	0.7	2.5	1.3
1970	41,983	36,231	1,835	1,911	316	1,414	276	100.0	86.3	4.4	4.6	0.8	3.4	0.7
1980	62,131	44,659	6,843	5,322	558	4,207	542	100.0	71.9	11.0	8.6	0.9	6.8	0.9
1990	65,016	47,395	10,248	2,330	1,797	2,910	335	100.0	72.9	15.8	3.6	2.8	4.5	0.5
Health-Related														
1960	2,928	968	1,520	325	0	84	31	100.0	33.1	51.9	11.1	0.0	2.9	1.1
1970	5,420	2,196	2,657	319	2	230	16	100.0	40.5	49.0	5.9	0.0	4.2	0.3
1980	8,362	1,845	5,605	571	0	256	85	100.0	22.1	67.0	6.8	0.0	3.1	1.0
1990	9,802	3,555	5,155	742	73	259	18	100.0	36.3	52.6	7.6	0.7	2.6	0.2
Education														
1960	12,696	235	12,113	70	59	171	48	100.0	1.9	95.4	0.6	0.5	1.3	0.4
1970	15,575	831	13,519	503	188	454	80	100.0	5.3	86.8	3.2	1.2	2.9	0.5
1980	23,158	539	21,406	440	139	557	77	100.0	2.3	92.4	1.9	0.6	2.4	0.3
1990	25,457	2,267	19,058	1,357	1,188	1,491	97	100.0	8.9	74.9	5.3	4.7	5.9	0.4

Source: From 1960 to 1989, School Fundamental Survey, Various Years.
For 1990, Quick Report of the School Fundamental Survey, 1990.

Appendix Table C-12

Factor Decomposition Analysis of the Increase in Employed Higher Education Graduates, Males, 1960-1988

Industrial Sector	Period	Increase in Employment (thds)			
		Total	of which due to		
			Industrial Structure	Education Structure	Inter-action
All Industries	1960 - 1970	1,884	924	719	241
	1970 - 1980	2,763	918	1,593	252
	1977 - 1982	1,799	463	1,268	68
	1982 - 1988	1,525	522	961	42
Primary Sector	1960 - 1970	13	(18)	45	(14)
	1970 - 1980	28	(23)	76	(25)
	1977 - 1982	28	(9)	42	(5)
	1982 - 1988	20	(10)	34	(3)
Secondary Sector	1960 - 1970	613	248	268	96
	1970 - 1980	693	50	614	30
	1977 - 1982	536	14	516	6
	1982 - 1988	407	59	340	8
Tertiary Sector	1960 - 1970	1,259	695	405	159
	1970 - 1980	2,041	891	903	247
	1977 - 1982	1,235	458	710	67
	1982 - 1988	1,098	473	587	38
Manufacturing	1960 - 1970	482	199	208	74
	1970 - 1980	402	(39)	459	(17)
	1977 - 1982	344	(26)	378	(7)
	1982 - 1988	294	47	240	7
Trade	1960 - 1970	478	143	243	92
	1970 - 1980	718	233	381	104
	1977 - 1982	384	66	302	16
	1982 - 1988	256	20	233	3
Bank/ Insurance	1960 - 1970	118	76	28	14
	1970 - 1980	221	115	74	32
	1977 - 1982	121	70	44	7
	1982 - 1988	131	81	44	6
Services	1960 - 1970	515	365	104	46
	1970 - 1980	797	478	235	84
	1977 - 1982	557	287	232	38
	1982 - 1988	608	391	186	31
Government	1960 - 1970	75	42	27	5
	1970 - 1980	196	43	132	20
	1977 - 1982	94	26	65	4
	1982 - 1988	63	(18)	83	(3)

Data: 1960, 1970, 1980, Census.
1977, 1982, 1988, Labor Force Survey.

Appendix Table C-13

Factor Decomposition Analysis of the Increase in Employed Higher Education Graduates, Females, 1960-1988

Industrial Sector	Period	Increase in Employment (thds)			
		Total	of which due to		
			Industrial Structure	Education Structure	Interaction
All Industries	1960 - 1970	749	192	371	186
	1970 - 1980	1,553	324	976	253
	1977 - 1982	1,262	405	717	140
	1982 - 1988	1,139	332	741	66
Primary Sector	1960 - 1970	11	(5)	22	(6)
	1970 - 1980	6	(14)	35	(16)
	1977 - 1982	15	(4)	21	(3)
	1982 - 1988	6	(6)	14	(2)
Secondary Sector	1960 - 1970	110	18	60	32
	1970 - 1980	177	10	156	11
	1977 - 1982	188	39	128	21
	1982 - 1988	193	15	172	6
Tertiary Sector	1960 - 1970	629	180	289	160
	1970 - 1980	1,370	328	784	258
	1977 - 1982	1,059	370	567	122
	1982 - 1988	940	323	555	62
Manufacturing	1960 - 1970	93	17	49	27
	1970 - 1980	131	(2)	134	(2)
	1977 - 1982	147	27	105	14
	1982 - 1988	164	12	146	5
Trade	1960 - 1970	169	30	88	51
	1970 - 1980	327	58	213	56
	1977 - 1982	229	54	152	23
	1982 - 1988	229	42	175	12
Bank/ Insurance	1960 - 1970	39	10	13	16
	1970 - 1980	96	25	47	24
	1977 - 1982	80	23	47	10
	1982 - 1988	120	28	80	12
Services	1960 - 1970	386	130	171	85
	1970 - 1980	861	235	460	166
	1977 - 1982	686	186	316	84
	1982 - 1988	554	251	265	38
Government	1960 - 1970	22	7	9	6
	1970 - 1980	55	10	35	11
	1977 - 1982	34	5	27	2
	1982 - 1988	19	(4)	25	(1)

Data: 1960, 1970, 1980, Census.
1977, 1982, 1988, Labor Force Survey.

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